

MDS-JA50ES

SERVICE MANUAL

US Model
AEP Model
UK Model



Photo: GOLD

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Model Name Using Similar Mechanism	NEW
MD Mechanism Type	MDM-4A
Base Unit Type	MBU-2B
Optical Pick-up Type	KMS-210A/J-N

SPECIFICATIONS

System	MiniDisc digital audio system
Disc	MiniDisc
Laser	Semiconductor laser ($\lambda = 780 \text{ nm}$) Emission duration: continuous
Laser output	Less than $44.6 \mu\text{W}^*$ * This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block with 7 mm aperture.
Laser diode properties	Material: GaAlAs
Revolutions (CLV)	400 rpm to 900 rpm
Error correction	Advanced Cross Interleave Reed Solomon Code (ACIRC)
Sampling frequency	44.1 kHz
Coding	Adaptive Transform Acoustic Coding (ATRAC)
Modulation system	EFM (Eight-to-Fourteen Modulation)
Number of channels	2 stereo channels
Frequency response	5 to 20,000 Hz $\pm 0.3 \text{ dB}$
Signal-to-noise ratio	Over 105 dB during playback
Wow and flutter	Below measurable limit

Inputs

	Jack type	Input impedance	Rated input	Minimum input
LINE(ANALOG) IN	Phono jacks	47 kilohms	500 mVrms	125 mVrms
DIGITAL IN COAXIAL	Phono jack	75 ohms	0.5 Vp-p, $\pm 20\%$	—
DIGITAL IN OPT1	Square optical connector jack	Optical wave length: 660 nm	—	—
DIGITAL IN OPT2	Square optical connector jack	Optical wave length: 660 nm	—	—

Outputs

	Jack type	Rated output	Load impedance
PHONES	Stereo phone jack	28 mW	32 ohms
LINE(ANALOG) OUT	Phono jacks	2 Vrms (at 50 kilohms)	Over 10 kilohms
DIGITAL OUT OPTICAL	Square optical connector jack	-18 dBm	Wave length: 660 nm

MINIDISC DECK



SONY®

General

Power requirements

Where purchased	Power requirements
U.S.A.	120 V AC, 60 Hz
Continental Europe	220 – 230 V AC, 50/60 Hz

Power consumption 26 W

Dimensions (approx.) (w/h/d) incl. projecting parts
430 × 125 × 375 mm
(17 × 5 × 14 7/8 in.)

Mass (approx.) 14.3 kg (31 lbs 3 oz)

Supplied accessories

- Audio connecting cords (2)
- Remote commander (remote) RM-D13M (1)
- Sony SUM-3 (NS) batteries (2)
- Operating Instructions
- Warranty card

Design and specifications are subject to change without notice.

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the equipment manufacturer.
Discard used batteries according to manufacture's instructions.

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

ADVARSEL

Eksplosjonsfare ved feilaktig skifte av batteri.
Benytt samme batteritype eller en tilsvarende type anbefalt av
apparatfabrikanten.
Brukte batterier katterier kasseres i henhold til fabrikantens

VARNIG

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en likvärdig typ som rekommenderas
av apparattillverkaren.
Kassera använt batteri enligt gällande föreskrifter.

VAROITUS

Parist voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.
Hävitätä käytetty paristo valmistajan ohjeiden mukaisesti.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:
Check the antenna terminals, metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE

The AC leakage from any exposed metal part to earth Ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

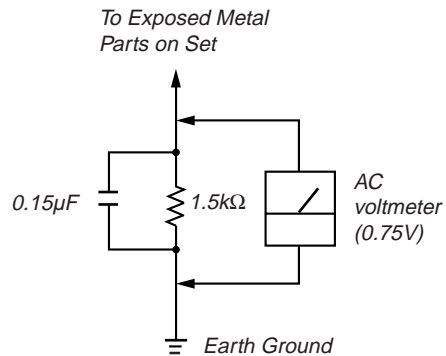
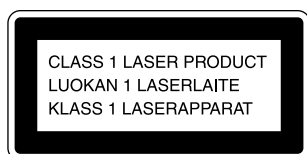


Fig. A. Using an AC voltmeter to check AC leakage.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK \triangle OR DOTTED LINE WITH MARK \triangle ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

The laser component in this product is capable of emitting radiation exceeding the limit for Class 1.



This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.

The following caution label is located inside the unit.

CAUTION	;	INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.
ADVARSEL	;	USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARO!	;	AVATTAESSA JA SUOJALUKITUS OHITETTAESSA DLET ALTTIINA LASERSATEILYLLE.
VARNING	;	LASERSTRÅLING NÅR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URÖPPPLAD.
ADVARSEL	;	USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES UNGÅ EKSPONERING FOR STRÅLEN.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

- Keep the temperature of soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

MODEL IDENTIFICATION

— BACK PANEL —

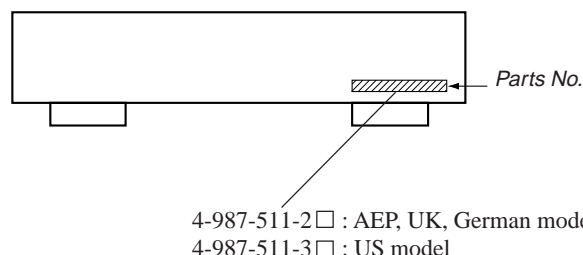


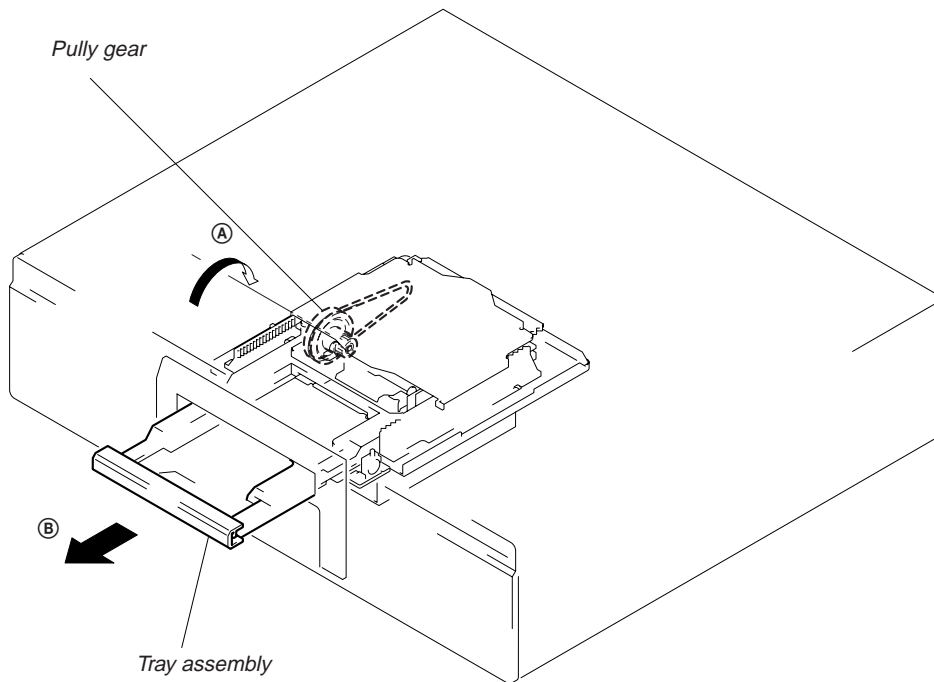
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SECTION 1 SERVICING NOTE

HOW TO OPEN THE DISC TRAY WHEN POWER SWITCH TURNS OFF

- ① Remove the fourteen screws (BVTT 3x8) from the bottom plate.
- ② Remove the bottom plate.
- ③ Rotate the pulley gear in the arrow direction (A), and open the tray assembly in the arrow direction (B).



FORCED RESET

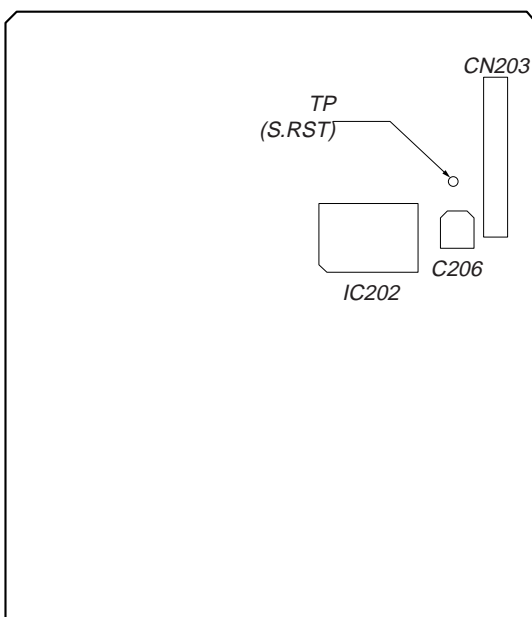
The system microprocessor can be reset in the following way.

Use these methods when the unit cannot be operated normally due to the overrunning of the microprocessor, etc.

Method 1:

Set TP (S.RST) of the DIG board to ground momentarily.

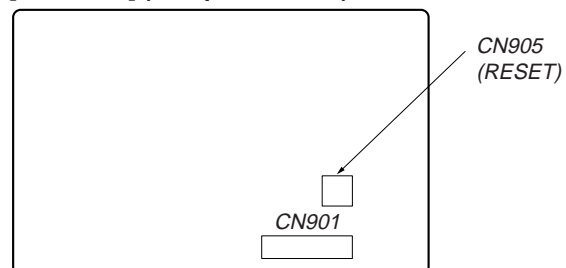
[DIG board] (Side A)



Method 2:

Disconnect the power plug, and short-circuit CN905 of the PW board with a pair of tweezers, etc.

[PW board] (Component Side)



RETRY CAUSE DISPLAY MODE

- In this test mode, the causes for retry of the unit during recording can be displayed on the fluorescent display tube. This is useful for locating the faulty part of the unit.
- The retry cause, number of retries, and number of retry errors are displayed. Each is displayed in hexadecimal number.

Method:

1. Load a recordable disc whose contents can be erased into the unit.
2. Press the ■ button, ≡OPEN/CLOSE button, DISPLAY/CHAR button simultaneously.
3. Press the ● button, and start recording.
4. The ## value increases with each retry. If an error occurs after a retry, the @@ count will also increase.
5. To exit the test mode, press the TIME button.

Fig. 1 Reading the Test Mode Display

R.T s * * c # # e @ @

Fluorescent Display Tube Signs

- * * : Cause of retry
: Number of retries
@ @ : Number of retry errors

All three displays above are in hexadecimal numbers.

Reading the Retry Cause Display

	Higher Bits				Lower Bits				Hexa- decimal	Cause of Retry	Occurring conditions
Hexadecimal	8	4	2	1	8	4	2	1			
Bit	b7	b6	b5	b4	b3	b2	b1	b0			
Binary	0	0	0	0	0	0	0	1	01	shock *1	When more than 3.5 shocks are detected
	0	0	0	0	0	0	1	0	02	ader5	When ADER was counted more than five times continuously
	0	0	0	0	0	1	0	0	04	Discontinuous address	When ADIP address is not continuous
	0	0	0	0	1	0	0	0	08	(Not used)	(Not used)
	0	0	0	1	0	0	0	0	10	FCS incorrect	When not in focus
	0	0	1	0	0	0	0	0	20	IVR rec error	When ABCD signal level exceeds the specified range
	0	1	0	0	0	0	0	0	40	Spindle is slow	When spindle rotation is detected as slow
	1	0	0	0	0	0	0	0	80	Access fault	When access operation is not performed normally

*1 Some displays are not used depending on the microprocessor version.

Reading the Display:

Convert the hexadecimal display into binary display. If more than two causes, they will be added.

Example

When 42 is displayed:

Higher bit : 4 = 0100 → b6

Lower bit : 2 = 0010 → b1

In this case, the retry cause is combined of “spindle is slow” and “ader5”.

When A2 is displayed:

Higher bit : A = 1010 → b7+b5

Lower bit : 2 = 0010 → b1

The retry cause in this case is combined of “access fault”, “IVR rec error”, and “ader5”.

Hexadecimal → Binary Conversion Table

Hexadecimal	Binary	Hexadecimal	Binary
0	0000	8	1000
1	0001	9	1001
2	0010	A	1010
3	0011	B	1011
4	0100	C	1100
5	0101	D	1101
6	0110	E	1110
7	0111	F	1111

Reference:

In this test mode, when the ▷ button is pressed, and the disc is played back, the “PLAYBACK MODE” is set.

The display becomes as shown in Fig. 2. The playback mode is not used in particular during servicing.

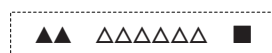


Fig. 2 Display during Playback Mode

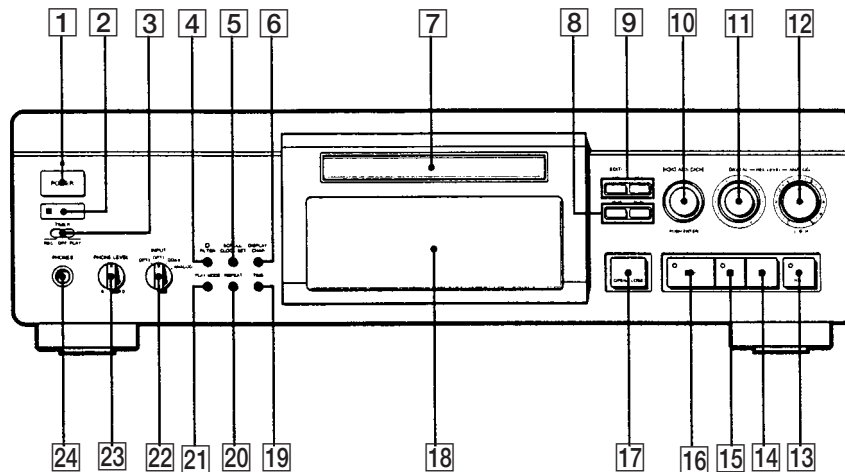
▲ : Parts No. (Name of area named on TOC)

△△△△△ : Address (Physical address on disc)

■ : Track mode (Copyright information of each part, information on copyright, etc.)

SECTION 2 GENERAL

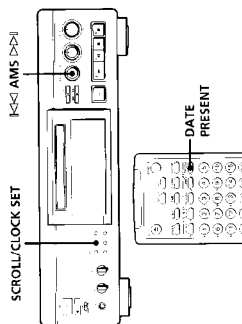
Location of Parts and Controls



- | | |
|---|-------------------------------------|
| 1 POWER switch | 10 AMS knob |
| 2 Remote sensor | 11 DIGITAL REC LEVEL knob |
| 3 TIMER switch | 12 ANALOG REC LEVEL L/R knob |
| 4 FILTER button | 13 ● REC (recording) button |
| 5 SCROLL/CLOCK SET button | 14 ■ (stop) button |
| 6 DISPLAY/CHAR button | 15 (pause) button |
| 7 Disc tray | 16 ► (play) button |
| 8 ◀◀/▶▶ (fast backward/fast forward) buttons | 17 ≡ OPEN/CLOSE button |
| 9 EDIT/NO /YES buttons | 18 Display window |
| Pressing the EDIT/NO button once, it becomes the edit menu and the recorded disc can be programmed. | 19 TIME button |
| Pressing it twice it becomes the set up menu (page 43), and various settings are possible. | 20 REPEAT button |
| | 21 PLAY MODE button |
| | 22 INPUT switch |
| | 23 PHONE LEVEL knob |
| | 24 PHONES jack |

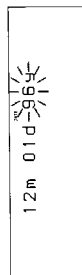
Setting the Clock

Once you set the MD deck's internal clock, the MD deck will automatically record the date and time of all recordings. When playing a track, you can display the date and time the track was recorded (see page 21). Time on this deck is displayed on a 12-hour clock (Canadian model only) or a 24-hour clock (European model only).

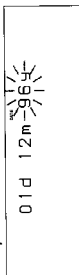


- 1 With the deck in standby status (the POWER indicator lights red), press SCROLL/CLOCK SET down for about 2 seconds until the year indication in the display starts flashing.

Canadian model

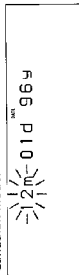


European model

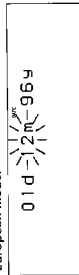


- 2 Turn AMS to enter the current year, then press AMS. The year indication stops flashing, and the month indication starts flashing.

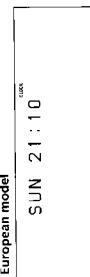
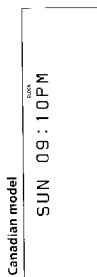
Canadian model



European model



- 3 Repeat Step 2 to enter the month, day, hour, and minute.



- 4 For precise time and date stamping of recordings Reset the time at least once a week.

Note
If the AC power cord is disconnected or the MAIN POWER switch on the rear panel has been set to OFF (only on the European model) for a long time, the memorized clock settings will disappear and "STANDBY" will flash in the display the next time you plug in and turn on the deck. If this happens, reset the clock.

Displaying the current date and time

You can display the current date and time any time even when the deck is in standby status.

Press DATE PRESENT.

Each press of the button changes the display as follows:

→ Current display → Date → Time

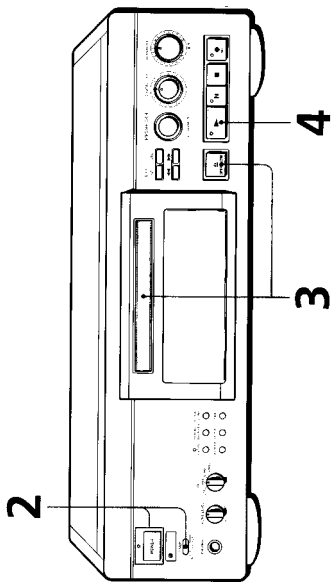
- 1 You can display the current date and time with an on-deck button

Press the SCROLL/CLOCK SET button. Each press of the button changes the display in the same order as the DATE PRESENT button on the remote does.

Changing the date and/or time

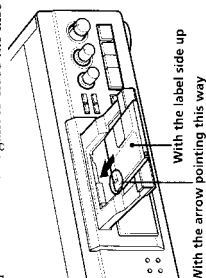
- 1 With the deck in standby status (the POWER indicator lights red), press SCROLL/CLOCK SET down for about 2 seconds until the year indication in the display starts flashing.
- 2 Press AMS repeatedly until the item you want to change flashes.
- 3 Turn AMS to change the contents of the selected item.
- 4 To complete the setting, press AMS repeatedly until all items stop flashing.

Playing an MD



See pages 4 and 5 for hookup information.

- 1 Turn on the amplifier and set the source selector to the position for MD deck.
- 2 After confirming that TIMER is set to OFF, press POWER. The POWER indicator changes from red to green.
- 3 Press OPEN/CLOSE to open the disc tray, insert an MD, and then press the button again to close the disc tray.



- 4 Press ►. The deck starts playing. Adjust the volume on the amplifier.

To Do the following:

Stop playing	Press ■
Pause playing	Press II. Press the button again or press ► to resume playing.
Go to the next track	Turn AMS clockwise (or press ► on the remote).
Go to the preceding track	Turn AMS counterclockwise (or press ◀ on the remote).
Take out the MD	Press ▲ OPEN/CLOSE after stopping playing.

- 1 You can locate and play back a track while the deck is stopped

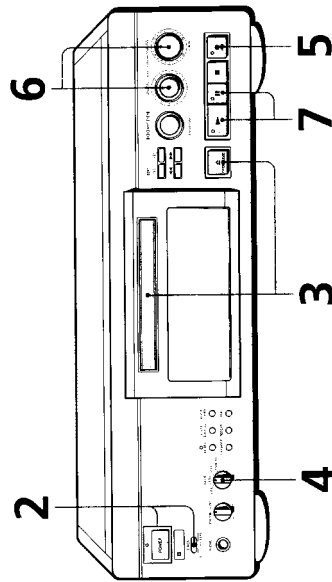
1 Turn AMS (or press ◀ or ▶) until the number of the track you want to play appears.

2 Press AMS or ►.

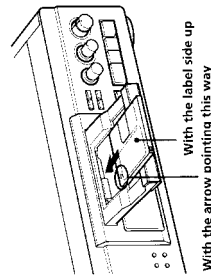
- 1 To use headphones

Connect them to PHONES jack. Use PHONE LEVEL to adjust the volume.

Recording on an MD



- 1** Turn on the amplifier and play the program source you want to record.
- 2** After confirming that **TIMER** is set to **OFF**, press **POWER**. The **POWER** indicator changes from red to green.
- 3** Insert a recordable MD and close the disc tray.



If the MD has a recorded material on it, the deck will automatically start recording from the end of the last recorded track.

- 4** Set **INPUT** to the corresponding input connector.

To record through	Set INPUT to
LINE/ANALOG IN	ANALOG
DIGITAL IN COAXIAL	COAX
DIGITAL IN OPT1	OPT1
DIGITAL IN OPT2	OPT2

- 5** Press **● REC**.
The deck becomes ready to record.
- 6** Adjust the recording level.
When recording through the DIGITAL IN COAXIAL, OPT1, or OPT2 connector
Setting the **DIGITAL REC LEVEL** control at 0 is satisfactory for most purposes. For details, see page 13.
When recording through the LINE/ANALOG IN connectors
Setting the **ANALOG REC LEVEL L/R** controls at 4 is satisfactory for most purposes. For details, see page 14.
- 7** Press **▶** or **||**.
Recording starts.
- 8** Start playing the program source.

Do not disconnect the deck from the power source immediately after recording

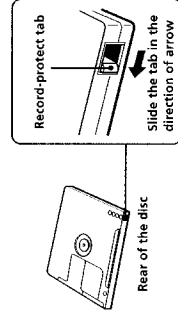
If you do, recorded material may not be saved to the MD. To save the material after recording, press **⏏ OPEN/CLOSE** to take out the MD or change the deck to standby by pressing **POWER**. "TOC Writing" will flash in the display at this time.
After "TOC Writing" steps flashing and goes out, you can pull out the AC power cord.

To	Press
Stop recording	■
Pause recording*	 Press the button again or press ▶ to resume recording.
Take out the MD	⏏ OPEN/CLOSE after stopping

* Whenever you pause recording, the track number increases by one. For example, if you paused recording while recording on track 4, the track number increases by one and recording continues on the new track when restarted.

To protect an MD against accidental erasure

To make it impossible to record on an MD, slide the tab in the direction of arrow, opening the slot. To allow recording, close the slot.



Notes on Recording

If "Protected" appears in the display

The MD is record-protected. Close the slot to record on the disc (see "To protect an MD against accidental erasure" on page 9).

If "Din Unlock" flashes in the display

- The digital program source is not connected as you set with the INPUT switch in Step 4 on page 8. To continue, connect the program source properly.
- The program source is not on.
- Turn on the program source.

Depending on the menu settings and source being recorded, track numbers are marked in following ways:

- When recording from a CD or MD with the INPUT switch set at COAX, OPT1, or OPT2 and the source connected through the respective DIGITAL IN connector:
 - The deck automatically marks track numbers in the same sequence as the original. If, however, a track is repeated two or more times (e.g. by single-track repeat play) or two or more tracks with the same track number (e.g. from different MDs or CDs) are played, the track or tracks are recorded as part of a single, continuous track with a single track number.
 - If the source is an MD, track numbers may not be marked for tracks of less than 4 seconds.
- When recording from a source connected through the LINE(ANALOG) IN connectors with the INPUT switch set at ANALOG or when recording from a DAT or satellite broadcast connected through one of the DIGITAL IN connectors with the INPUT switch set at the respective digital position and "T.Mark Off" selected in the S02 menu:
 - The source will be recorded as a single track.
- Even while recording an analog source or a DAT or satellite broadcast, you can mark track numbers if a setting other than "T.Mark Off" is selected in the S02 menu (see "Marking Track Numbers While Recording" on page 14).
- When recording from DAT or satellite broadcasts with the INPUT switch set at the respective digital position, the deck automatically marks a track number whenever the sampling frequency of the input signal changes regardless of the S02 menu setting.

You can mark track numbers during or after recording

For details see "Marking Track Numbers While Recording" (page 14) and "Dividing Recorded Tracks" (page 31).

You can mark track numbers at 1- or 5-minute intervals

For details, see "Marking track numbers automatically at regular intervals" (page 15).

When "TOC Writing" flashes in the display

The deck is currently updating the Table Of Contents (TOC). Do not move the deck or pull out the AC power cord. Changes to an MD made through recording are saved only when you update the TOC by ejecting the MD or changing the deck to standby by pressing the POWER switch.

The MD deck uses the SCMS (Serial Copy Management System on page 40)

MDs recorded through digital input connector cannot be copied onto other MDs or DAT tapes through the digital output connector.

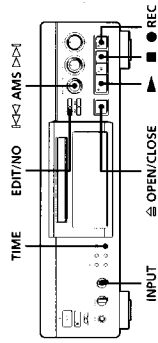
When recording digital signals that have been emphasized (in the higher frequencies)

The signal is automatically de-emphasized (with attenuation proportional to the degree of emphasis) and the level of the de-emphasized signal is indicated on the peak level meters.

When the deck is recording or in recording pause, digital signals input through one of the DIGITAL IN connectors are output to the DIGITAL OUT OPTICAL connector with the same sampling rate

To change the digital input signal to another sampling rate for output (without recording it to an MD), use Input Monitor Function (see page 11).

Useful Tips for Recording



Checking the remaining recordable time on the MD

Press TIME.

- When you press the TIME button while recording, the remaining recordable time on the MD appears.
- When you press the TIME button repeatedly while the deck is stopped, the display alternates between total disc playing time and remaining recordable time on the MD (see page 20).

Monitoring the input signal (Input Monitor)

Before starting recording, you can monitor the selected input signal through the deck's output connectors.

- Press Δ OPEN/CLOSE to remove the MD.
- Set INPUT according to the input signal you want to monitor.

When the INPUT switch is set at ANALOG

The analog signal input through the LINE(ANALOG) IN connectors is output to the DIGITAL OUT OPTICAL connector after A/D conversion, and then to the LINE(ANALOG) OUT connectors and the PHONES jack after D/A conversion.

When the INPUT switch is set to a digital source

After passing through the sampling rate converter, the digital signal input through the respective DIGITAL IN connector is output to the DIGITAL OUT OPTICAL connector, and after D/A conversion to the LINE(ANALOG) OUT connectors and PHONES jack. Either "32kHz", "44.1kHz", or "48kHz" appears in the display depending on the sampling rate of the digital signal.

- Press \bullet REC.

If the INPUT switch is set at ANALOG, "AD-DA" appears in the display.

If the INPUT switch is set at a digital position, "DA" appears in the display.

If "Auto Cut" appears in the display (Auto Cut)

There has been no sound input for 30 seconds during recording. The 30 seconds of silence are replaced by a blank of about 3 seconds and the deck changes to recording pause.



You can turn off the Auto Cut Function

For details, see "To turn off the Smart Space Function and Auto Cut Function" below. Note that when you turn off the Auto Cut Function, the Smart Space Function is turned off automatically.

If "Smart Space" appears in the display (Smart Space)

There has been an extended silence of 4 to 30 seconds in length during recording. The silence is replaced with a blank of about 3 seconds and the deck continues recording. Note that new track numbers may not be marked for portions recorded while this function is activated.

To turn off the Smart Space Function and Auto Cut Function

- While the deck is stopped, press EDIT/NO twice.
- Turn AMS to display the S08 menu, then press AMS.
- Turn AMS to select "S-Space Off", then press AMS.
- Press EDIT/NO.

To turn on the Smart Space Function and Auto Cut Function again

- Do Steps 1 and 2 in "To turn off the Smart Space Function and Auto Cut Function" above.
- Turn AMS to select "S-Space On", then press AMS.
- Press EDIT/NO.

Notes

- When you turn off the Smart Space Function, the Auto Cut Function is also turned off automatically.
- The Smart Space Function and Auto Cut Function are factory set to on.
- The Smart Space Function does not affect the order of the track numbers being recorded, even if the blank space occurs in the middle of a track.
- If you turn off the deck or disconnect the AC power cord, the deck will recall the last setting (On or Off) of the Smart Space and Auto Cut Functions the next time you turn on the deck.

Playing back tracks just recorded

Do this procedure to immediately play back tracks that have just been recorded.

Press **▶** immediately after stopping recording.

Playback starts from the first track of the material just recorded.

To play from the first track of the MD after recording

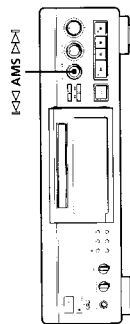
1 Press **■** again after stopping recording.

2 Press **▶**.

Playback starts from the first track of the MD.

Recording Over Existing Tracks

Follow the procedure below to record over existing material just as you would on an analog cassette tape.



1 Do Steps 1 to 4 in "Recording on an MD" on page 8.

2 Turn AMS (or press **◀▶** or **▶▶**) until the number of the track to be recorded over appears.

3 To record from the start of the track, continue from Step 5 in "Recording on an MD" on page 9.

While "TR" flashes in the display

The deck is recording over an existing track, and stops flashing when it reaches the end of the recorded portion.

To record from the middle of the track

1 After Step 2 above, press **▶** to start playback.

2 Press **■** where you want to start recording.

3 Continue from Step 5 in "Recording on an MD" on page 9.

Note

You cannot record from the middle of an existing track when the "PROGRAM" or "SHUFFLE" is on.

3 Turn AMS to select the levels to be adjusted by turning DIGITAL REC LEVEL.

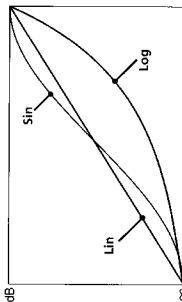
To	Select
adjust both the recording and playback levels	DigLvl All
adjust the recording level only	DigLvl Rec
disable the DIGITAL REC LEVEL control	DigLvl Off

4 Press EDIT/NO.

You can select the type of increment/decrement curve for adjusting recording and/or playback level

1 While the deck is stopped, press EDIT/NO twice.
2 Turn AMS to display the S13 menu, then press AMS.
3 Turn AMS to select "DigLvl Lin", "DigLvl Sin", or "DigLvl Log", then press EDIT/NO.

The increment/decrement curves are shown in the graph below.
All curves become "Lin" when the signal level goes beyond 0 dB.



The No Clip Function can be used to decrease the recording level gradually when a signal of excessively high level is input during digital recording.

To turn on the No Clip Function by menu setting

1 While the deck is stopped, press EDIT/NO twice.

2 Turn AMS to display the S09 menu, then press AMS.

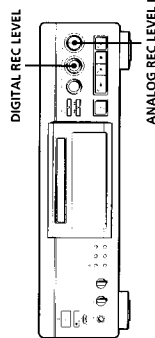
3 Turn AMS to select "No Clip On", then press EDIT/NO.

To turn on the No Clip Function using the remote
Press NO CLIP to display "No Clip On."

(Continued)

Adjusting the Recording Level

Use the DIGITAL REC LEVEL control or the ANALOG REC LEVEL L/R controls to adjust the recording level before starting recording.

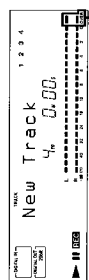


Adjusting the digital recording level

1 Do Steps 1 to 5 in "Recording on an MD" on pages 8 and 9.

2 Play the portion of the program source with the strongest signal level.

3 While monitoring the sound, turn DIGITAL REC LEVEL (or press DIGITAL REC LEVEL +/-) to adjust the recording level so that the peak level meters reach their highest point without turning on the OVER indication. Occasional lighting of "OVER" is acceptable.



4 Stop playing the program source.

5 To start recording, do the procedure starting from Step 7 in "Recording on an MD" on page 9.

You can use the S12 menu to select the signal levels adjusted by the DIGITAL REC LEVEL control

1 While the deck is stopped, press EDIT/NO twice.

2 Turn AMS to display the S12 menu, then press AMS.

⚙️ The Peak Hold Function freezes the level meter display at the highest level reached by the input signal.

- To turn on the Peak Hold function by menu setting**
- 1 While the deck is stopped, press EDIT/NO twice.
 - 2 Turn AMS to display the S10 menu, then press AMS.
 - 3 Turn AMS to select "P.Hold On", then press EDIT/NO.

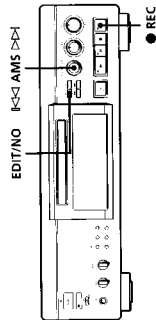
To turn on the Peak Hold Function using the remote
Press P.HOLD to display "P.Hold On."

Adjusting the analog recording level

- 1 Do Steps 1 to 5 in "Recording on an MD" on pages 8 and 9.
- 2 Play the portion of the program source with the strongest signal level.
- 3 While monitoring the sound, turn ANALOG REC LEVEL L and R.
- 4 Stop playing the program source.
- 5 To start recording, do the procedure starting from Step 7 in "Recording on an MD" on page 9.

Marking Track Numbers While Recording (Track Marking)

You can mark track numbers either manually or automatically. By marking track numbers at specific points, you can quickly locate the points later using the AMS Function, or use various Editing Functions.



Marking track numbers manually (Manual Track Marking)

You can mark track numbers at any time while recording on an MD.

Press **• REC** at the place you want to add a track mark while recording.

Marking track numbers automatically (Automatic Track Marking)

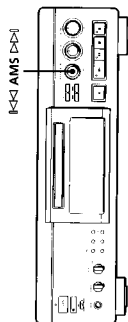
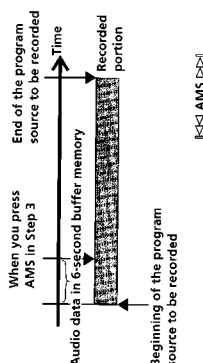
The deck adds track marks differently in the following cases:

- When recording from CDs or MDs with the INPUT switch set at a digital source:
The deck marks track numbers automatically.
- In all other cases:
If "T.Mark L.Syn" is selected in the S02 menu, the deck marks a new track number whenever the signal drops to the specified level or below for a specified amount of time or longer, then rises to a specified level. To select "T.Mark Off" or "T.Mark L.Syn" in the S02 menu, do the procedure below:

- 1 While the deck is stopped, press EDIT/NO twice.
- 2 Turn AMS to display the S02 menu, then press AMS.
- 3 Turn AMS to select "T.Mark Off" or "T.Mark L.Syn", then press AMS.
"L.SYNC" lights up when you select "T.Mark L.Syn."
- 4 Press EDIT/NO.

Starting Recording With 6 Seconds of Prestored Audio Data (Time Machine Recording)

When recording from an FM or satellite broadcast, the first few seconds of material are often lost due to the time it takes you to ascertain the contents and press the record button. To prevent the loss of this material, the Time Machine Recording Function constantly stores 6 seconds of the most recent audio data in a buffer memory so that when you begin recording, the program source using this function, the recording actually begins with the 6 seconds of audio data stored in the buffer memory in advance as shown in the illustration below.



- 1 Do Steps 1 to 5 in "Recording on an MD" on pages 8 and 9.
The deck changes to recording pause.
- 2 Start playing the program source you want to record.
The most recent 6 seconds of audio data is stored in the buffer memory.
- 3 Press AMS (or T.REC) to start Time Machine Recording.
Recording of the program source starts with the 6 seconds of audio data stored in the buffer memory.

(Continued)

To stop Time Machine Recording

Press ■

Note

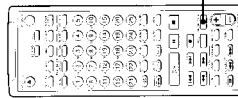
The deck starts storing audio data when the deck is in recording pause and you start playing the program source. With less than 6 seconds of playing of the program source and audio data stored in the buffer memory, Time Machine Recording starts with less than 6 seconds of audio data.

Synchro-Recording With Audio Equipment of Your Choice (Music Synchro-Recording)



By using the MUSIC SYNC button on the remote, you can automatically start recording in sync with the signal input from the program source.

The method of marking track numbers differs, depending on the program source being recorded and the setting of the S02 menu (see "Notes on Recording" on page 10).



- 1 Do Steps 1 to 4 in "Recording on an MD" on page 8.

- 2 Press MUSIC SYNC.

The deck changes to recording pause.

- 3 Start playing the program source you want to record.

The deck starts recording automatically.

To stop Music Synchro-Recording

Press ■

Note

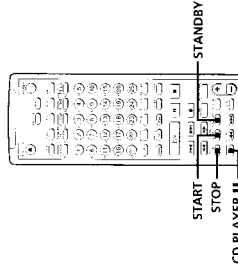
When Music Synchro-Recording, the Smart Space Function and the Auto Cut Function turn on automatically regardless of their setting (On or Off) and type of input (digital or analog).

Synchro-Recording With a Sony CD Player



By connecting your deck to a Sony CD player or Hi-Fi Component System, you can easily dub CDs onto MDs using the CD synchro buttons on the remote. If your deck is connected to a Sony CD player by a digital input cable, track numbers are automatically marked as appear on the original even when "T.Mark Off" is selected in the S02 menu. If your deck is connected to a Sony CD player by audio connecting cords through the LINE(ANALOG) IN connectors, track numbers are automatically marked when you set the S02 menu to "T.Mark LSyn" (see page 14).

As the same remote controls both the CD player and the deck, you may have trouble operating both units if they are far from each other. If you do, place the CD player close to this deck.



- 1 Set the source selector on the amplifier to CD.
- 2 Do Steps 2 to 4 in "Recording on an MD" on page 8 to prepare the deck for recording.
- 3 Insert a CD into the CD player.
- 4 Select the playback mode (Shuffle Play, Program Play, etc.) on the CD player.
- 5 Press STANDBY.
The CD player pauses for playing and the deck pauses for recording.

- 6 Press START.

The deck starts recording and the CD player starts playback.
The track number and elapsed recording time of the track appear in the display.

If the CD player does not start playing

Some CD player models may not respond when you press START on the remote of the deck. Press ■ on the remote of the CD player instead.

- 7 Press STOP to stop synchro-recording.

To pause recording

Press STANDBY or CD PLAYER II.

To restart recording, press START or CD PLAYER II.
A new track number is marked each time you pause recording.

You can use the remote of the CD player during synchro-recording

When you press ■, the CD player stops and the deck pauses for recording.
When you press ■, the CD player pauses and the deck pauses for recording.
To restart synchro-recording, press ▷.

You can change CDs during synchro-recording

Do the following steps instead of Step 7 above.

- 1 Press ■ on the remote of the CD player.
The deck pauses for recording.
- 2 Change the CD.
- 3 Press ▷ on the remote of the CD player.
Synchro-recording restarts.

You can also do synchro-recording with a Sony video CD player

Using the procedure for synchro-recording with a Sony CD player, you can do synchro-recording with a Sony video CD player also.

To select the video CD player, press button number 2 while pressing down the POWER button on the remote before starting the procedure.

To select the CD player again, press button number 1 while pressing down the POWER button.

The deck is factory set to a CD player for synchro-recording.

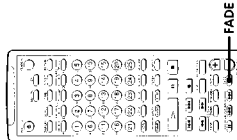
You can check the remaining recordable time on the MD

Press TIME (see page 20).

Fading In and Out (Fader)

You can gradually increase the recording level at the beginning of a recording (fade in) or gradually decrease the recording level at the end of a recording (fade out).

This function is convenient when, for example, you don't want the track cut off abruptly when the disc reaches its end.




Fade-in recording


During recording pause, press FADE at the position where you want to start fade-in recording. "FADE IN" flashes in the display and the deck performs the fade-in recording until the counter reaches "00s."

Fade-out recording

During recording, press FADE at the position where you want to start fade-out recording. "FADE OUT" flashes in the display and the deck performs the fade-out recording until the counter reaches "00s." The deck changes to recording pause when fade-out recording finishes.

 You can set the duration of fade-in and fade-out recording independently.

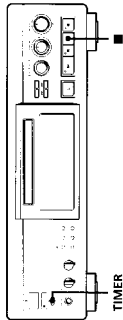
- 1 While the deck is stopped, press EDIT/NO twice.
 - 2 To set the duration of fade-in recording:
Turn AMS to display the S14 menu, then press AMS.
 - 3 To set the duration of fade-out recording:
Turn AMS to display the S15 menu, then press AMS.
- Both the fade-in and fade-out recording durations can be set within the following range:
- 1.0 to 3.0 seconds (in 0.2 second steps)
 - 3.0 to 5.0 seconds (in 0.4 second steps)
 - 5.0 to 15.0 seconds (in 1 second steps)
- 4 After selecting the duration, press AMS.
 - 5 Press EDIT/NO.



 You can select the type of increment/decrement curve for fade-in/fade-out recording.

- 1 While the deck is stopped, press EDIT/NO twice.
- 2 To select the curve for fade-in recording:
Turn AMS to display the S16 menu, then press AMS.
- 3 To select the curve for fade-out recording:
Turn AMS to display the S17 menu, then press AMS.
- 4 Press EDIT/NO.

Recording on an MD Using a Timer

By connecting a timer (not supplied) to the deck, you can start and stop recording operations at specified times. For further information on connecting the timer and setting the starting and ending times, refer to the instructions that came with the timer.



- 1 Do Steps 1 to 6 in "Recording on an MD" on pages 8 and 9.
- 2 If you want to specify the time for the start of recording, press .
 - If you want to specify the time for the end of recording, do Steps 7 and 8 of "Recording on an MD" on page 9.
 - If you want to specify the time for both start and end of recording, press .
- 3 Set TIMER on the deck to REC.
- 4 Set the timer as required.
 - When you have set the time for the start of recording, the deck turns off. When the specified time arrives, the deck turns on and starts recording.
 - When you have set the time for the end of recording, recording continues. When the specified time arrives, the deck stops recording and turns off.
 - When you have set the time for both the start and end of recording, the deck turns off. When the starting time arrives, the deck turns on and starts recording. When the ending time arrives, the deck stops recording and turns off.

- 5 After you have finished using the timer, set TIMER on the deck to OFF. Then place the deck in standby status by plugging the AC power cord of the deck into a wall outlet or set the timer to continuous operation.
 - If TIMER is left at REC, the deck will automatically start recording the next time you turn the deck on.
 - If you do not change the deck to standby status for more than a month after timer recording has finished, the recorded contents may disappear.

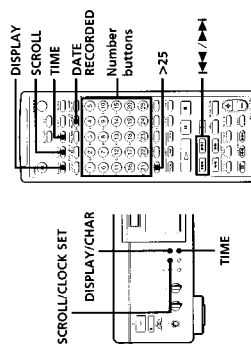
Make sure to change the deck to standby status within a week after timer recording is completed
The TOC on the MD is updated and recorded contents are written to the MD when you turn the deck on. If the recorded contents have disappeared, "Standby" flashes when you turn the deck on.

Notes

- During timer recording, new material is recorded from the end of the recorded portion on the MD.
- Material recorded during timer recording will be saved to the disc the next time you turn the deck on. "TOC" will flash in the display at that time. Do not move the deck or pull out the AC power cord while "TOC" is flashing.
- Timer recording will stop if the disc becomes full.
- Set the digital recording level for timer recording using the DIGITAL REC LEVEL control on the deck. If you set the recording level using the DIGITAL REC LEVEL +/- buttons on the remote, the digital timer recording will be performed at the level set by the DIGITAL REC LEVEL control.

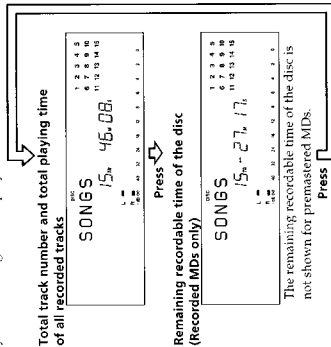
Using the Display

You can use the display to check disc and track information such as the total track number, total playing time of the tracks, remaining recordable time of the disc, disc name, and the date when a track was recorded.

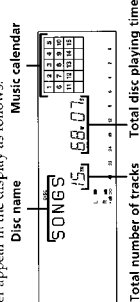


Checking the total track number, total disc playing time, remaining recordable time of the disc

Each time you press TIME while the deck is stopped, you can change the display as follows:



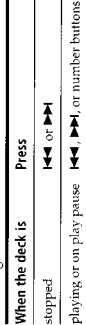
When you insert an MD, the disc name, total number of tracks, total disc playing time, and the music calendar appear in the display as follows:



Displaying the recording date

When the internal clock has been set, the deck automatically records the recording date and time of all recordings. You can then check the recording date and time of a track.

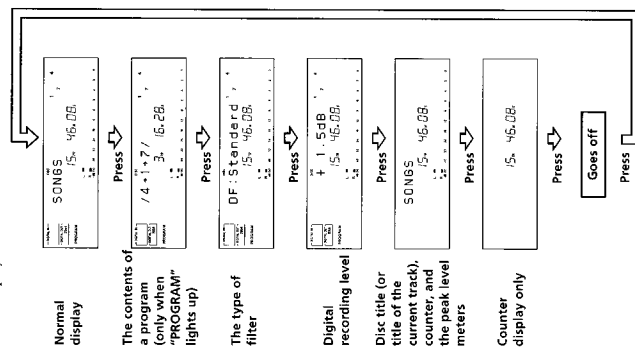
- 1 Locate the track for which you want to check the recording date and time.



- 2 Press DATE RECORDED. 'No Date' appears if the internal clock has not been set or the track was recorded on another MD deck without a date and time stamp function.

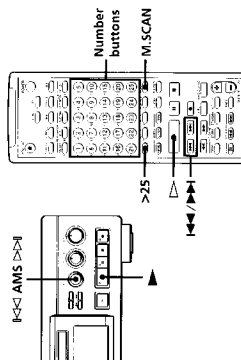
Changing the display

Each time you press DISPLAY/CHAR (or DISPLAY) while the deck is stopped or playing, you can change the display as follows:



Locating a Specific Track

You can quickly locate any track while playing a disc by using the AMS (Automatic Music Sensor) control, the left and right buttons, number buttons, or M-SCAN button on the remote.



To locate

The next or succeeding tracks
The current or preceding tracks
A specific track directly

Do the following:

During playback, turn AMS clockwise or press the right button repeatedly until you find the track.

During playback, turn AMS counterclockwise or press the left button repeatedly until you find the track.

Press number buttons to enter the track number.

1 Turn AMS until the track number you want to locate appears while the deck is stopped. (The track number is flashing.)

2 Press AMS or the right button.

By scanning each track for 6 seconds (music scan) 1 Press M-SCAN before you start playing.

2 When you find the track you want, press the right button to start playing.

When you directly locate a track with a number over 25

You must press >25 first, before entering the corresponding digits.

Press >25 once if it is a 2-digit track number, and twice if it is a 3-digit track number.

To enter "0," press button 10.

Examples: 1 To play track number 30, Press >25 once, then 3 and 10.

2 To play track number 100, Press >25 twice, then 1, 10 and 10.

(Continued)

You can extend the playing time during music scan

- 1 While the deck is stopped, press EDIT/NO twice.
- 2 Turn AMS to display the S11 menu and press AMS.
- 3 Turn AMS to select the playing time within a range of 6 to 20 seconds (in 1 second steps) and press AMS.
- 4 Press EDIT/NO.

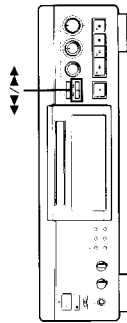
To pause playing at the beginning of a track

Turn AMS (or press ◀◀ or ▶▶) after pausing playback.

To go quickly to the beginning of the last track
Turn AMS counterclockwise (or press ◀◀) while the display shows the total track number, total disc playing time or remaining recordable time of the disc (recordable disc only), or disc name (see page 20).

Locating a Particular Point in a Track

You can also use the ◀◀ and ▶▶ buttons to locate a particular point in a track during playback or playback pause.



To locate a point

While monitoring the sound ▶▶ (forward) or ◀◀ (backward) and keep pressing until you find the point.

Quickly by observing the display during playback pause ▶▶ or ◀◀ and keep pressing until you find the point. There is no sound output during this operation.

If "Over—" appears while you are pressing ▶▶ during playback pause

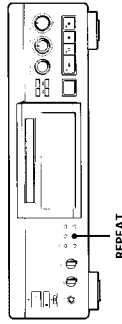
The G1C has reached to its end. Press ◀◀ (or ◀◀) or turn AMS counterclockwise to go back.

Notes

- If the disc reaches the end while you are pressing ▶▶ during sound monitoring, the deck stops.
- Tracks that are only a few seconds long may be too short to scan using the search function. For such tracks, it is better to play the MD at normal speed.

Playing Tracks Repeatedly

You can play tracks repeatedly in any play mode.



Press REPEAT.

"REPEAT" appears in the display.

The deck repeats the tracks as follows:

When the MD is played in	The deck repeats
Normal play (page 7)	All the tracks
Shuffle Play (page 23)	All the tracks in random order
Program Play (page 24)	The same program

To cancel repeat play

Press REPEAT several times (or CONTINUE once) until "REPEAT" disappears.

The deck returns to the original playing mode.

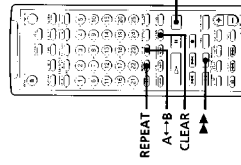
Repeating the current track

While the track you want to repeat is playing in normal, Shuffle, or Program Play, press REPEAT several times until "REPEAT 1" appears in the display.

Repeating a specific portion (A-B Repeat)

You can play a specific portion of a track repeatedly. This might be useful when you want to memorize lyrics.

Note that you can only repeat a portion within the boundaries of a single track.



- 1 While playing a disc, press A-B at the starting point (point A) of the portion to be played repeatedly.

"REPEAT A" appears and "B" flashes in the display.

- 2 Continue playing the track or press ▶▶ until you reach the ending point (point B), then press A-B again.

"REPEAT A-B" lights continuously. The deck starts to play the specified portion repeatedly.

To cancel A-B Repeat

Press REPEAT, CLEAR, or ■.

Setting new starting and ending points

You can repeat the portion immediately after the currently specified portion by changing the starting and ending points.

- 1 Press A-B while "REPEAT A-B" appears.

The current ending point B becomes the new starting point A. "REPEAT A" lights continuously, and "B" flashes in the display.

- 2 Continue playing the track or press ▶▶ until you reach the new ending point (point B), then press A-B again.

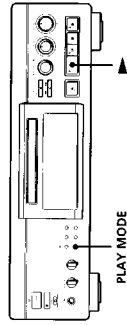
"REPEAT A-B" lights continuously and the deck starts playing repeatedly the newly specified portion.

Note

If you turn off the deck or disconnect the AC power cord, the deck will recall the last setting of the Repeat Function the next time you turn on the deck.
The A-B Repeat settings, however, are lost.

Playing in Random Order (Shuffle Play)

You can have the deck "shuffle" tracks and play them in random order.



- 1 Press PLAY MODE repeatedly (or SHUFFLE once) until "SHUFFLE" appears in the display when the deck is stopped.

- 2 Press ▶▶ to start Shuffle Play.
"G2" appears in the display while the deck is "shuffling" the tracks.

To cancel Shuffle Play

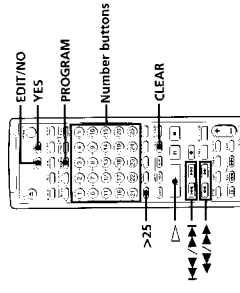
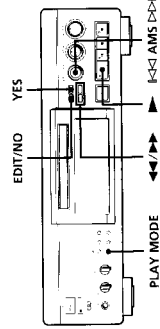
Press PLAY MODE repeatedly (or CONTINUE once) until "SHUFFLE" disappears.

You can specify tracks during Shuffle Play

- To play the next track, turn AMS clockwise (or press ▶▶).
- To play from the beginning of the current track again, turn AMS counterclockwise (or press ◀◀). You cannot use AMS (or ◀◀) to go to tracks that have already been played.

Creating Your Own Program (Program Play)

You can specify the playback order of the tracks on an MD and create your own programs containing up to 25 tracks.



- 1 While the deck is stopped, press EDIT/NO twice.
- 2 Turn AMS to select the S01 menu and display "Program ?". then press AMS.

- 3 Do either a) or b):

a) When using the controls on the deck

- 1 Turn AMS until the track number you want appears in the display.
- 2 Press AMS.

b) When using the remote

- 1 Press the number buttons to enter the tracks you want to program in the order you want.
- 2 To program a track with a number over 25, use the >25 button (see page 21).

If you enter the wrong track number

Press ◀◀ or ▶▶ until the wrong track number flashes, then enter the correct track number with the number buttons.

- 4 Repeat Step 3 to enter other tracks. Each time you enter a track, the total program time is added up and appears in the display.
- 5 After finishing programming, press YES. "Complete?" appears and programming is completed.
- 6 Press PLAY MODE repeatedly (or PROGRAM once) until "PROGRAM" appears in the display.
- 7 Press ▶ to start Program Play.

To cancel Program Play

Press PLAY MODE repeatedly (or CONTINUE once) when the deck is stopped until "PROGRAM" disappears.

The program remains even after Program Play ends

When you press ▶, you can play the same program again.

Note

The display shows "m - s" instead of the total playing time when the total playing time of the program exceeds 199 minutes.

Checking the track order

Turn AMS (or press ◀◀ or ▶▶) during playback or playback pause. The track numbers appear in the order they were programmed.

To cancel Auto Space

Cancel the function through menu operation on the deck

- 1 Do Steps 1 and 2 of "Inserting blank spaces while recording to tape" on this page.
- 2 Turn AMS to select "Auto Off", then press AMS.
- 3 Press EDIT/NO.

Cancelling the function using the remote

While the deck is stopped, press A SPACE repeatedly until "Auto Off" appears.

Note

If the Auto Space Function is on while recording a selection containing multiple track numbers (for example, a medley or symphony), blank spaces will be inserted within the selection whenever the track number changes.

Pausing after each track (Auto Pause)

When the Auto Pause Function is on, the deck pauses after playing each track. Auto Pause is convenient when recording single tracks or multiple, nonconsecutive tracks.

Select "Auto Pause" instead of "Auto Space" in Step 3 on "Inserting blank spaces while recording to tape" on this page.

You can turn on the Auto Pause Function using the remote

While the deck is stopped, press A SPACE repeatedly until "Auto Pause" appears in the display.

To restart playback

Press ▶ or II.

To cancel Auto Pause

Cancel the function through a menu operation on the deck

Do Steps 1 to 3 of "To cancel Auto Space" on this page.

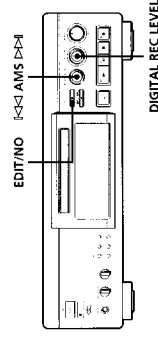
Cancelling the function using the remote

While the deck is stopped, press A SPACE repeatedly until "Auto Off" appears.

Note

If you turn off the deck or disconnect the AC power cord, the deck will recall the last setting of the Auto Space and Auto Pause Functions the next time you turn on the deck.

Useful Tips When Recording From MDs to Tape



Inserting blank spaces while recording to tape (Auto Space)

The Auto Space Function inserts a 3-second blank space between each track while recording from MDs to tapes, allowing you to use the AMS function during later playback.

- 1 While the deck is stopped, press EDIT/NO twice.
- 2 Turn AMS to display the S07 menu, then press AMS.
- 3 Turn AMS to select "Auto Space", then press AMS.
- 4 Press EDIT/NO.

You can turn on the Auto Space Function using the remote

While the deck is stopped, press A SPACE repeatedly until "Auto Space" appears in the display.

Changing the bit length of the digital output signals

By changing the bit length, you can improve the sound quality of the signal output from the DIGITAL OUT OPTICAL connector to an MD deck or a 20-bit format DA converter.

- 1 While the deck is stopped, press EDIT/NO twice.
- 2 Turn AMS to display the S06 menu, then press AMS.
- 3 Turn AMS to select "Dout 20bit", then press AMS.
- 4 Press EDIT/NO.

Notes

- This function affects only digital signal output from the DIGITAL OUT OPTICAL connector.
- A momentary sound dropout occurs when the bit length setting is changed during playback or recording.

Adjusting the analog signal level

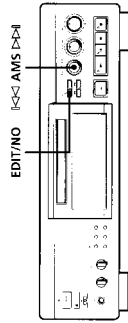
You can adjust the level of an analog signal for output to an amplifier connected through the LINE(ANALOG) OUT connectors.

- 1 While the deck is stopped, press EDIT/NO twice.
- 2 Turn AMS to display the S12 menu, then press AMS.
- 3 Turn AMS to select "DigLvl All", then press AMS.
- 4 Press EDIT/NO.

- 5 Turn DIGITAL REC LEVEL (or DIGITAL REC LEVEL +/-) to adjust the analog output level. The maximum level is output when you set the control to 0. Turning the control function in the + direction does not result in a further increase in output level.

Starting Playback From a Specific Position the Next Time You Start Playback (Resume Play)

You can specify the start of playback from the position where playback was last stopped or the deck was turned off, or from next track after that position.



- 1 While the deck is stopped, press EDIT/NO twice.
- 2 Turn AMS to display the S06 menu, then press AMS.
- 3 Set the position where you want playback to start the next time you start playback.

To start playback where you last stopped playback

- 1 Turn AMS to select "Resume Play", then press AMS.

To start playback from the track after the position where you stopped playback

- 1 Turn AMS to select "Resume Next", then press AMS.

- 2 Press EDIT/NO.

- 3 After you stop playback or turn the deck off and press the ► button to start playback again, playback starts from the position you set in Step 3 above.

To turn off the Resume Play Function

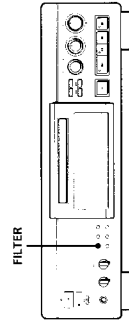
- 1 Do Steps 1 and 2 above.
- 2 Turn AMS to select "Resume Off", then press AMS.
- 3 Press EDIT/NO.

Playing Back With Different Tones (Digital Filter)

This deck is equipped with the V.C. (Variable Coefficient) filters to allow you adjust the tone to match your audio system, listening environment, and the source being played back.

Note

The digital filters are effective only on the analog signals output from the LINE(ANALOG) OUT connectors and the PHONES connector.



- 1 Press FILTER. The currently selected filter appears in the display.
- 2 Press FILTER repeatedly to select the filter that you want. Each press of the button changes the filter as follows:

DF-Standard → DF-Spline → DF-Analog → DF-Plane

You can select the filter using the remote

Press FILTER repeatedly until the filter that you want appears in the display.

What is a V.C. (Variable Coefficient) filter?

A variable coefficient filter changes the sound characteristics of a signal by applying specific frequency cut-off conditions. Such filters are provided on digital devices such as CD players and MD decks to remove aliasing noise. Your deck comes with four types of digital filters: standard, spline, plane, and analog. A brief description is given below of the sound characteristics of each filter.

Standard

This filter produces an expansive sound of wide range.

Spline

This filter produces a sound that is clearly positioned and smooth.

Plane

This filter produces a fresh and powerful sound.

Analog

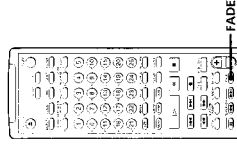
This filter produces a resonant and mellow sound.

Notes

- A momentary sound dropout occurs when the filter setting is changed during playback or recording.
- The change in sound characteristics caused by digital filters occur mainly in the inaudible range, not the audible range as in the case of an amplifier.

Fading In and Out (Fader)

You can gradually increase the playback level of the signal output from the LINE(ANALOG) IN/OUT connectors and the PHONES connector at the beginning of a playback (fade in) or gradually decrease the playback level at the end of a playback (fade out). This function is convenient when, for example, you want to start or end playback in the middle of the track.



Fade-in playback

During playback pause, press FADE at the position where you want fade-in playback to start.

"FADE IN" flashes in the display and the deck performs fade-in playback until the counter reaches to "0.0s."

Playing MDs

Fade-out playback

During playback, press **FADE** at the position where you want fade-out playback to start. "FADE OUT" flashes in the display and the deck performs fade-out recording until the counter reaches "0.0s."

The deck changes to play pause when fade-out playback finishes.

Note on the peak level meters display during fade-in/fade-out playback

The peak level meters show the level of the original signal (input from the LINE(ANALOG) IN connectors or output to the LINE(ANALOG) OUT connectors and the PHONES connector). Therefore, the level shown on the meters does not increase or decrease even as the output fades in or out.

You can set the duration of fade-in and fade-out playback independently

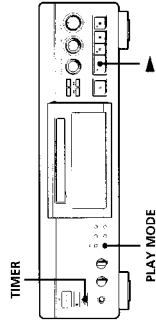
Do Steps 1 to 5 in "You can set the duration of the fade-in and fade-out recording independently" on page 18.

You can select the type of increment/decrement curve for fade-in/fade-out recording

Do Steps 1 to 4 in "You can select the type of increment/decrement curve for fade-in/fade-out recording" on page 18.

Playing an MD Using a Timer

By connecting a timer (not supplied) to the deck, you can start and stop playback operations at specified times. For further information on connecting the timer or setting the starting and ending times, refer to the instructions that came with the timer.



- 1 Do Steps 1 to 3 in "Playing an MD" on page 7.
- 2 Press **PLAY MODE** repeatedly (or one of the **PLAY MODE** buttons once) to select the play mode you want.
To play only specific tracks, create a program (see page 24).

Editing Recorded MDs

Notes on Editing

You can edit the recorded tracks after recording, using the following functions:

- **Erase Function** allows you to erase recorded tracks simply by specifying the corresponding track number.

- **A-B Erase Function** allows you to specify a portion within a track to erase it.
- **Divide Function** allows you to divide tracks at specified points so that you can quickly locate those points afterwards, using the AMS function.
- **Combine Function** allows you to combine two consecutive tracks into one.
- **Move Function** allows you to change the order of tracks by moving a specific track to a track position you want.
- **Title Function** allows you to create titles for your recorded MDs and tracks.

If "Protected" appears in the display

The deck could not edit because the record-protect slot on the MD is open. Edit after closing the slot.

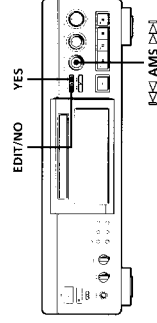
When "TOC" flashes in the display

Do not move the deck or pull out the AC power cord. After editing, "TOC" lights continuously until you eject the MD or turn off the power. "TOC Writing" flashes while the deck is updating the TOC. When the deck finishes updating the TOC, "TOC" goes off.

Erasing Recordings (Erase Function)

Do the procedures below to erase following:

- A single track
- All tracks

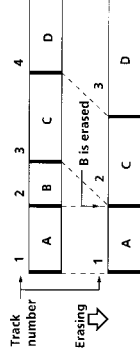


Erasing a single track

You can erase a track simply by specifying the respective track number. When you erase a track, the total number of tracks on the MD decreases by one and all tracks following the erased one are renumbered. Since erasing merely updates the TOC, there is no need to record over material.

To avoid confusion when erasing multiple tracks, you should proceed in order of high to low track number to prevent the renumbering of tracks that have not been erased yet.

Example: Erasing B



- 1 While the deck is stopped, playing, or pausing, press **EDIT/NO**.
- 2 Turn **AMS** until "Erase ?" appears in the display.
- 3 Press **AMS**.
The display for erasing tracks appears and playback of the displayed track starts.
- 4 Turn **AMS** to select the track to be erased.
- 5 Press **AMS** or **YES**.
When the track selected in Step 4 has been erased, "Complete!" appears for a few seconds and the total number of tracks in the music calendar decreases by one.
If you erase a track during playback, the track following the deleted track begins playing afterwards.
- 6 Repeat Steps 1 to 5 to erase more tracks.

To cancel the Erase Function

Press **EDIT/NO** or **■**.

Note

If "Erase ????" appears in the display, the track was recorded or edited on another MD deck and is record-protected. If this indication appears, press **YES** to erase the track.

Erasing all tracks on an MD

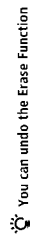
Erasing a recordable MD deletes the disc name, all recorded tracks, and titles (see page 36).

- 1 While the deck is stopped, playing, or pausing, press EDIT/NO.
- 2 Turn AMS until "All Erase ?" appears in the display.
- 3 Press AMS.
"All Erase??" appears in the display and all tracks in the music calendar start flashing.

- 4 Press AMS or YES.
When the disc name, all recorded tracks, and titles on the MD has been erased, "Complete!!" appears for a few seconds and the music calendar disappears.

To cancel the Erase Function

Press EDIT/NO or ■ to turn off the "All Erase ?" or "All Erase??" indication.

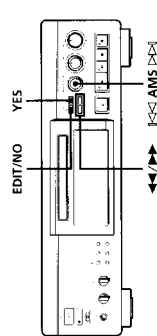
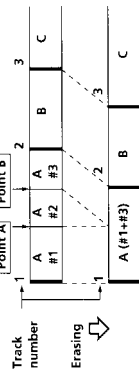


You can undo the Erase Function
See "Undoing the Last Edit" on page 36.

Erasing a Part of a Track (A-B Erase Function)

You can specify a portion within a track and erase the portion with ease. It is convenient when erasing unnecessary sections after recording satellite broadcast or FM broadcast.

Example: Erasing a part of track A

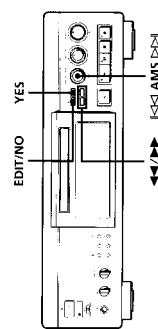
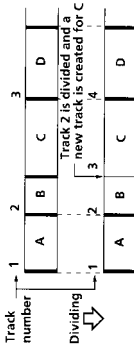


- 1 While the deck is stopped, playing, or pausing, press EDIT/NO.
- 2 Turn AMS until "A-B Erase ?" appears in the display.
- 3 Press AMS.
- 4 Turn AMS to select the number of the track, then press AMS.
"Rehearsal" and "Point A ok?" alternates in the display while the deck plays back the selected track from the beginning.
- 5 While monitoring the sound, turn AMS to find the starting point of the portion to be erased (point A).
You can select the unit by which the starting point is shifted. Press the ◀ or ▶ button to select frame, second, or minute.
For frame, the number of frames appears when you turn the AMS control; for second and minute, "S" or "M" flashes in the display.
- 6 If the point A is still incorrect, repeat Step 5 until it is correct.

Dividing Recorded Tracks (Divide Function)

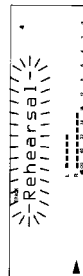
With the Divide Function you can assign a track number at places that you want to randomly access afterwards. Use this function to add tracks to MDs recorded from an analog source (and therefore contain no track numbers), or to divide an existing track into multiple portions for locating positions in the middle of a track. When you divide a track, the total number of tracks on the MD increases by one and all tracks following the divided track are renumbered.

Example: Dividing track 2 to create a new track for C



Dividing a track after selecting the track

- 1 While the deck is stopped, playing, or pausing, press EDIT/NO.
- 2 Turn AMS until "Divide ?" appears in the display and press AMS.
- 3 Turn AMS to select the track to be divided and press AMS.
"Rehearsal" appears in the display and the deck plays back the selected track from the beginning.

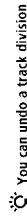


(Continued)

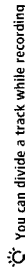
- 4** While monitoring the sound, turn AMS to find the point to divide the track.
You can select the unit by which the starting point is shifted. Press the ◀◀ or ▶▶ button to select frame, second, or minute.
For frame, the number of frames appears when you turn the AMS control; for second and minute, “S” or “M” flashes in the display.

- 5** Press YES or AMS when the position is correct.
“Complete!” appears for a few seconds and the newly created track begins playing. The new track will have no track title even if the original track was labeled. The total number of tracks in the music calendar increases by one.

To cancel the Divide Function
Press ■.



You can undo a track division
Combine the tracks again (see “Combining Recorded Tracks” on this page) then redive the tracks if necessary.



You can divide a track while recording
Use the Track Marking Function (see page 14).

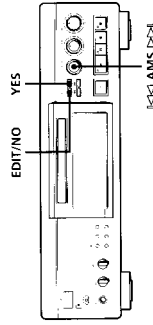
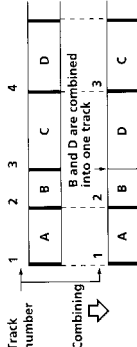
Dividing a track after selecting the dividing point

- While playing the MD, press AMS at the point where you want to create a new track.
“Release!” appears in the display and playback continues from the position you selected.
- To make fine adjustment on the dividing position, do Step 4 in “Dividing a track after selecting the track” on this page.
- Press EDIT/NO to display “Divide ?” and press YES or AMS.

Combining Recorded Tracks (Combine Function)

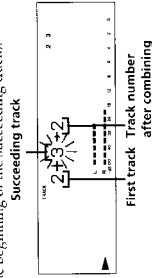
Use the Combine Function to combine tracks on a recorded MD. The two tracks to be combined need not be consecutive and the latter track to be combined can be the track which comes before the former one in the track number order. This function is useful for combining several songs into a single medley, or several independently recorded portions into a single track. When you combine two tracks, the total number of tracks decreases by one and all tracks following the combined tracks are renumbered.

Example: Combining B and D

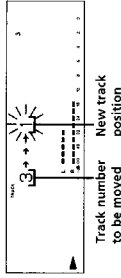


- While the deck is stopped, playing, or pausing, press EDIT/NO.
- Turn AMS until “Combine ?” appears in the display.
- Press AMS.
- Turn AMS to select the first track of the two to be combined and press AMS.

The display for selecting the second track appears and the deck repeats the portion where the two tracks will join (i.e., the end of the first track and the beginning of the succeeding track).



- Turn AMS.
- Turn AMS to select the track to be moved and press AMS.
- Turn AMS until the new track position appears.



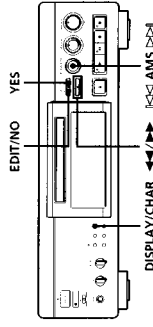
- Press YES or AMS.
“Complete!” appears for a few seconds and the moved track begins playing back if the deck is in playback mode.

To cancel the Move Function

Press EDIT/NO or ■.

Labeling Recordings (Title Function)

You can create titles for your recorded MDs and tracks. Titles — which may consist of uppercase and lowercase letters, numbers and symbols for a maximum of about 1,700 characters per disc — appear in the display during MD operation. You can label a track or an MD by using the controls on the deck or on the remote.



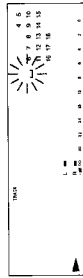
Use the following procedure to label a track or an MD.
You can label a track while it is playing, pausing or recording. If the track is playing or recording, be sure to finish labeling before the track ends. If the track ends before you've completed the labeling procedure, the characters already entered are not recorded and the track will remain unlabeled.

- Press EDIT/NO.
- Turn AMS until “Name ?” appears in the display and press AMS.

(Continued)

- 3** Turn AMS until "Name in ?" appears in the display, then press AMS.

- 4** Turn AMS to select "Disc" to label an MD, or to specify the track to label, and press AMS. A flashing cursor appears in the display.



- 5** Press DISPLAY/CHAR to select the character type as follows:

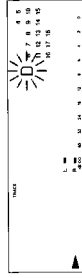
To select	Press DISPLAY/CHAR repeatedly until
Uppercase letters	"A" appears in the display
Lowercase letters	"a" appears in the display
Numbers	"0" appears in the display



- 6** Turn AMS to select the character. The selected character flashes.

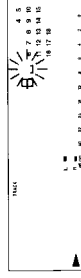
Letters, numbers, and symbols appear in sequential order as you turn AMS. You can use the following symbols in titles:

! " # \$ % & ' () * + , - . / : ; < = > ? @ _



You can press DISPLAY/CIAR to change the character type at any time during Step 6 (see Step 5).

- 7** Press AMS to enter the selected character. The cursor shifts rightward and waits for the input of the next character.



- 8** Repeat Steps 6 and 7 until you have entered the entire title.

If you entered the wrong character

Press ◀◀ or ▶▶ until the character to be corrected starts flashing, and repeat Steps 6 and 7 to enter the correct character.

To erase a character

Press ◀◀ or ▶▶ until the character to be erased starts flashing, then press EDIT/NO.

To enter a space

Press AMS or ▶▶ while the cursor is flashing.

Press YES.

- 9** This completes the labeling procedure and the title appears in the display.

To cancel labeling

Press ■.

Note

You cannot label a track or an MD while you are recording over an existing track.

Copying a track or disc title

You can copy a track or disc title to use it as a title of another track or the disc title within a disc. Note that you can do this operation by using the controls on the deck only.

- 1** Press EDIT/NO.

- 2** Turn AMS until "Name ?" appears in the display and press AMS.

- 3** Turn AMS until "Nm Copy ?" appears in the display.

- 4** Press AMS.

- 5** Turn AMS to select "Disc" to copy the disc title, or the track whose title you want to copy and press AMS.

If "No Name" appears in the display

The disc or the track has no name.

- 6** Turn AMS to select "Disc" for disc title or to specify the track number to copy a title, and press AMS.

"Complete!" appears for a few seconds to indicate that the copying operation is completed.

To cancel title copying

Press EDIT/NO or ■.

- 5** Press NAME again. This completes the labeling procedure and the title appears in the display.

To cancel labeling

Press ■.

Changing an existing title

- 1** Press NAME, then do the following:

To change	Make sure that the deck is
A track title	Playing, pausing the track whose title is to be changed, or stopped after locating the track whose title is to be changed
A disc name	Stopped with no track number appearing in the display

- 2** Hold down CLEAR or EDIT/NO until the current title is erased.

- 3** Enter the new title.

Do Steps 5 to 8 of "Labeling Recordings" on page 34, or Steps 2 to 4 of "Labeling tracks and MDs with the remote" on this page.

- 4** Press NAME.

Erasing a title on a disc (Name Erase)

Use this function to erase a title on a disc.

- 1** While the deck is stopped, playing, or pausing, press EDIT/NO.

- 2** Turn AMS until "Name ?" appears in the display and press AMS.

- 3** Turn AMS until "Nm Erase ?" appears in the display and press AMS.

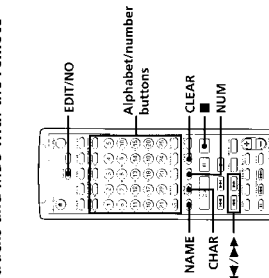
- 4** Turn AMS to select "Disc" to erase the disc title, or the track whose title you want to erase and press AMS.

"Complete!" appears for a few seconds and the title is erased.

To cancel Name Erase Function

Press ■.

Labeling tracks and MDs with the remote



- 1** Press NAME repeatedly until a flashing cursor appears in the display, then do the following:

To label	Make sure that the deck is
A track	Playing, pausing, recording the track to be labeled, or stopped after locating the track to be labeled
An MD	Stopped with no track number appearing in the display

- 2** Select the character type as follows:

To select	Press
Uppercase letters	CHAR repeatedly until "Selected AB" appears in the display
Lowercase letters	CIAR repeatedly until "Selected ab" appears in the display
Numbers	NUM repeatedly until "Selected 12" appears in the display

- 3** Press an alphabet/number button to enter a character.

After you enter a character, the cursor shifts rightward and waits for the input of the next character.

You can change the character type at any time during Step 3 (see Step 2).

- 4** Repeat Step 3 until you have entered the entire title.

If you entered the wrong character

Press ◀◀ or ▶▶ until the character to be corrected starts flashing.

Press CLEAR to erase the incorrect character, then enter the correct one.

Editing Recorded MDs

Erasing all titles on a disc (Name All Erase)

Use this function to erase all titles on an MD simultaneously.

- 1 While the deck is stopped, press EDIT/NO.
- 2 Turn AMS until "Name ?" appears in the display and press AMS.
- 3 Turn AMS until "Nm All Ers ?" appears in the display and press AMS.
"Nm All Ers?" appears in the display.
- 4 Press AMS.
"Complete!" appears for a few seconds and the all the titles is erased.

To cancel the Name All Erase Function

Press ■.

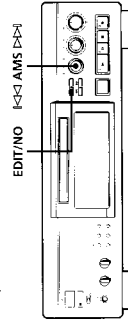
You can undo the Name All Erase Function
See "Undoing the Last Edit" on this page.

You can erase all recorded tracks and titles
See "Erasing all tracks on an MD" on page 30.

Undoing the Last Edit (Undo Function)

You can use the Undo Function to cancel the last edit and restore the contents of the MD to the condition that existed before editing was done. Note, however, that you cannot undo an edit if you do any of the following after the edit:

- Press the ● REC button on the deck.
- Press the ● button, the MUSIC SYNC. button, or the CD SYNC STANDBY button on the remote.
- Update the TOC by turning off the power or ejecting the MD.
- Disconnect the AC power cord or set the MAIN POWER switch on the rear panel to OFF (only on European model).



- 1 With the deck stopped and no track number appearing in the display, press EDIT/NO and turn AMS until "Undo ?" appears in the display. "Undo ?" does not appear if no editing has been done.

- 2 Press AMS.
One of the following messages appears in the display, depending on the type of editing to be undone:
- | Editing done: | Message: |
|-----------------------------|------------------|
| Erasing a single track | |
| Erasing all tracks on an MD | "Erase Undo ?" |
| Erasing a part of a track | |
| Dividing a track | "Divide Undo ?" |
| Combining tracks | "Combind Undo ?" |
| Moving a track | "Move Undo ?" |
| Labeling a track or an MD | |
| Changing an existing title | "Name Undo ?" |
| Erasing all titles on an MD | |
| Copying a title | |

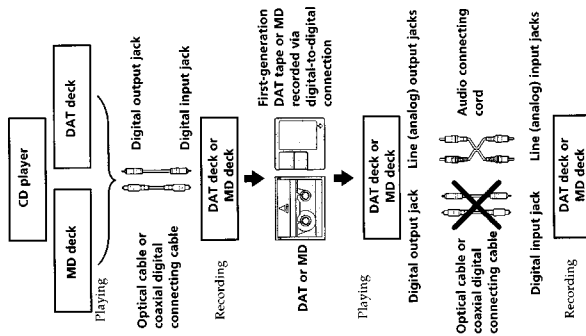
- 3 Press AMS again.
"Complete!" appears for a few seconds and the contents of the MD are restored to the condition that existed before the edit.

To cancel the Undo Function
Press EDIT/NO or ■.

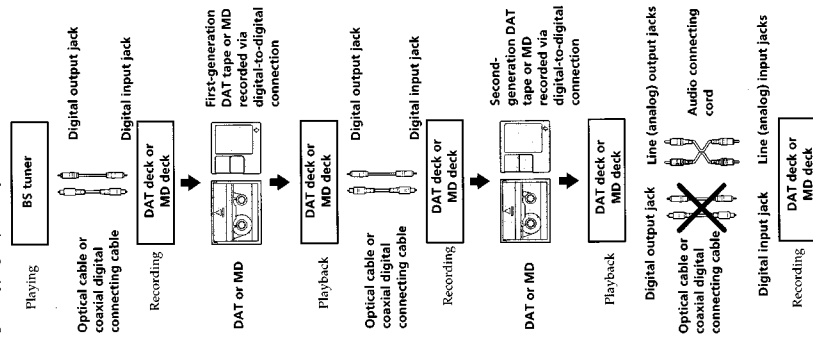
Guide to the Serial Copy Management System

This MD deck uses the Serial Copy Management System, which allows only first-generation digital copies to be made of premastered software via the deck's digital input jack. An outline of this system appears below:

- 1 You can record from digital program sources (CDs, DATs or premastered MDs) onto a DAT tape or recordable MD via digital input jack on the DAT or MD deck. You cannot, however, record from this recorded DAT tape or MD onto another DAT tape or recordable MD via the digital input jack on the DAT or MD deck.



- 2 You can record the digital input signal of a digital satellite broadcast onto a DAT tape or recordable MD via the digital input jack on the DAT or MD deck which is capable of handling a sampling frequency of 32 kHz or 48 kHz. You can then record the contents of this recorded DAT tape or MD (first-generation) onto another DAT tape or recordable MD via digital input jack on the DAT or MD deck to create a second-generation digital copy. Subsequent recording from the second-generation copy onto another recordable DAT tape or MD is possible only through the analog input jack on the DAT or MD deck. Note, however, that on some BS tuners, second-generation digital copying may not be possible.



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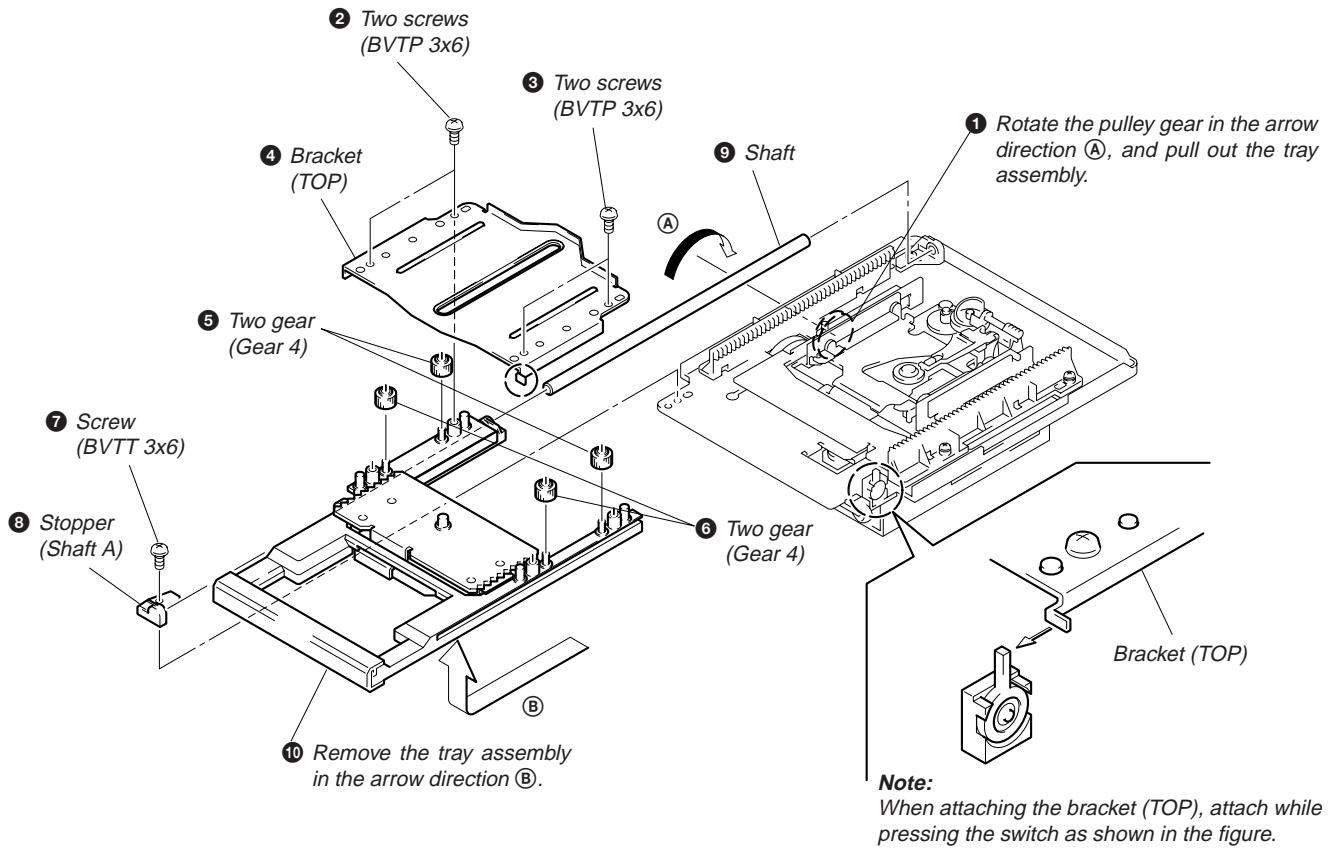
You can make various settings on this deck by using setup menus. Operation related to each menu were explained in the previous sections. The table below outlines each menu, including the various parameters and default settings.

Menu number	Function	Parameters	Default setting	See
S01	Creates a program.	—	—	page 24
S02	Sets the track marking function.	T.Mark Off, T.Mark LSyn, T.Mark Lmin, T.Mark 5min	T.Mark LSyn	page 14
S03	Sets the reference level of the input signal when "T.Mark LSyn" is selected in the S02 menu	LS(T)-72 to 0dB	LS(T)-50dB	page 15
S04	Sets the duration of silence portion to be detected when "T.Mark LSyn" is selected in the S02 menu	LS(W)0.0 to 9.5s	LS(W)1.5s	page 15
S05	Sets the Resume Play mode.	Resume Off, Resume Play, Resume Next	Resume Off	page 26
S06	Switches the bit length for the digital output signal.	Dout 20bit, Dout 16bit	Dout 20bit	page 26
S07	Turns the Auto Space and Auto Pause Functions on and off.	Auto Off, Auto Space, Auto Pause	Auto Off	page 25
S08	Turn the Smart Space Function on and off.	S.Space Off, S.Space On	S.Space On	page 11
S09	Turns the No Clip Function on and off.	No Clip On, No Clip Off	No Clip Off	page 13
S10	Turns the Peak Hold function on and off for the peak level meters.	P.Hold On, P.Hold Off	P.Hold Off	page 14
S11	Sets the playing time during music scan.	M.Scan 6 to 20s	M.Scan 6s	page 22
S12	Selects the signal to be adjusted using the DIGITAL REC LEVEL control.	DigLvl Off, DigLvl Rec, DigLvl All	DigLvl Rec	pages 13 and 26
S13	Selects the type of increment/decrement curve of the signal level when the DIGITAL REC LEVEL control is turned.	DigLvl Lin, DigLvl Sin, DigLvl Log	DigLvl Lin	page 13
S14	Sets the duration of fade-in recording and playback.	FadeIn 1.0 to 15s	FadeIn 5.0s	pages 18 and 28
S15	Sets the duration of fade-out recording and playback.	FadeOut 1.0 to 15s	FadeOut 5.0s	pages 18 and 28
S16	Selects the type of increment curve of the signal level for fade-in recording and playback.	FadeIn Lin, FadeIn Sin, FadeIn Log	FadeIn Lin	pages 18 and 28
S17	Selects the type of decrement curve of the signal level for fade-out recording and playback.	FadeOut Lin, FadeOut Sin, FadeOut Log	FadeOut Lin	pages 18 and 28

SECTION 3 DISASSEMBLY

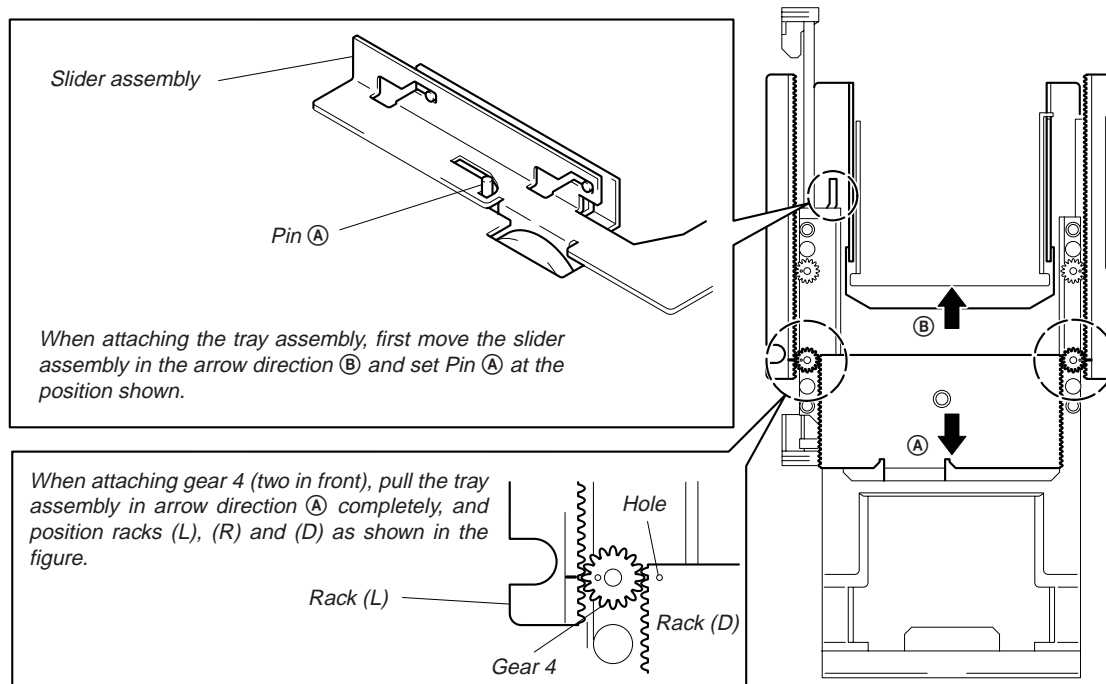
Note : Follow the disassembly procedure in the numerical order given.

3-1. TRAY ASSEMBLY

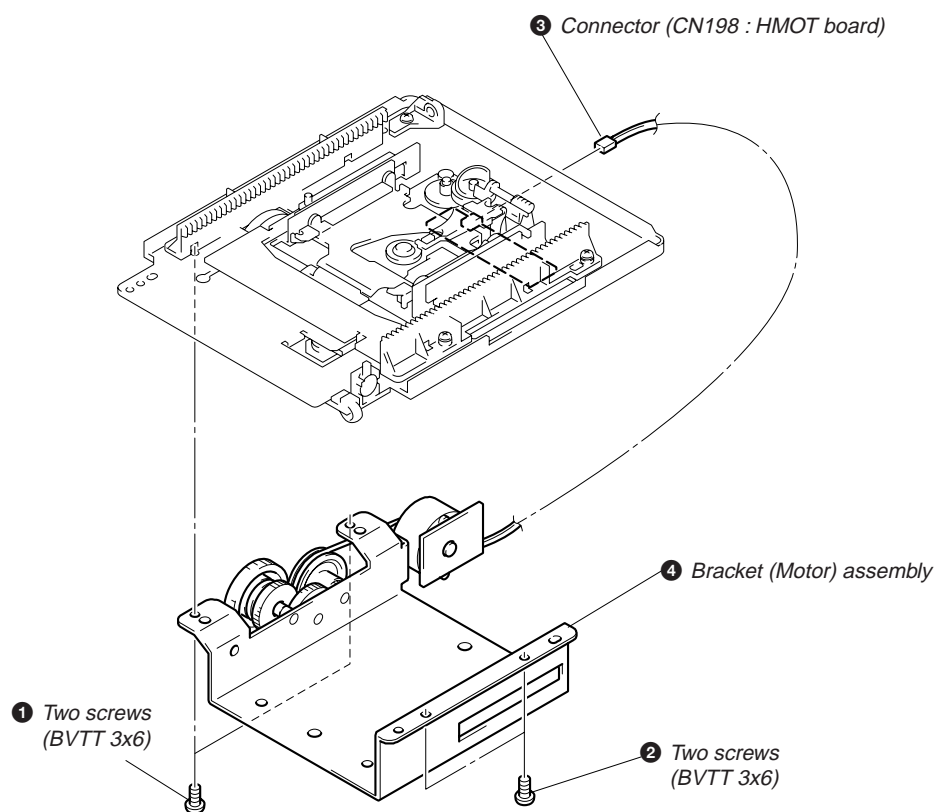


• Precautions on Attaching

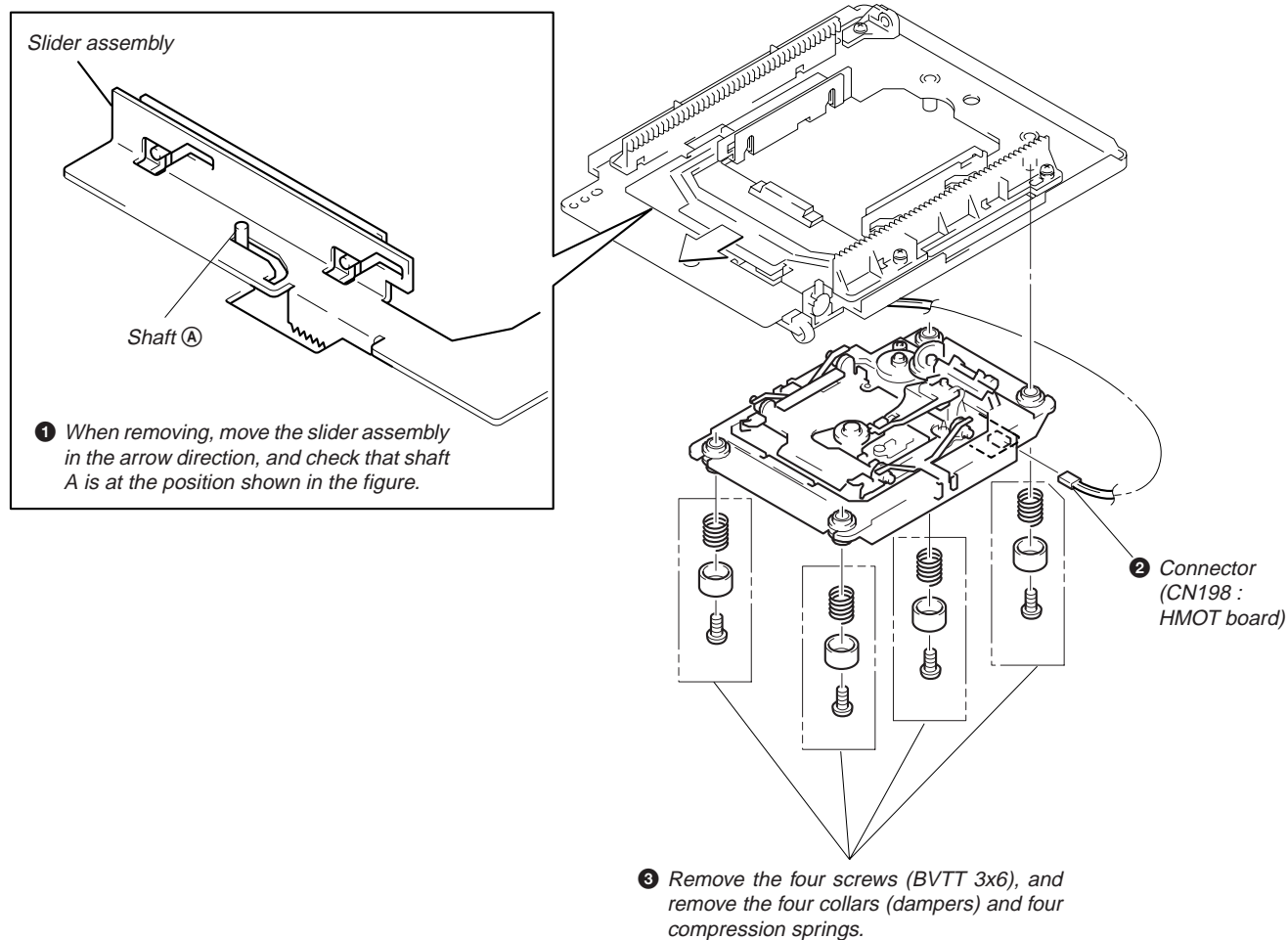
(Assemble in the reverse order of removal.)



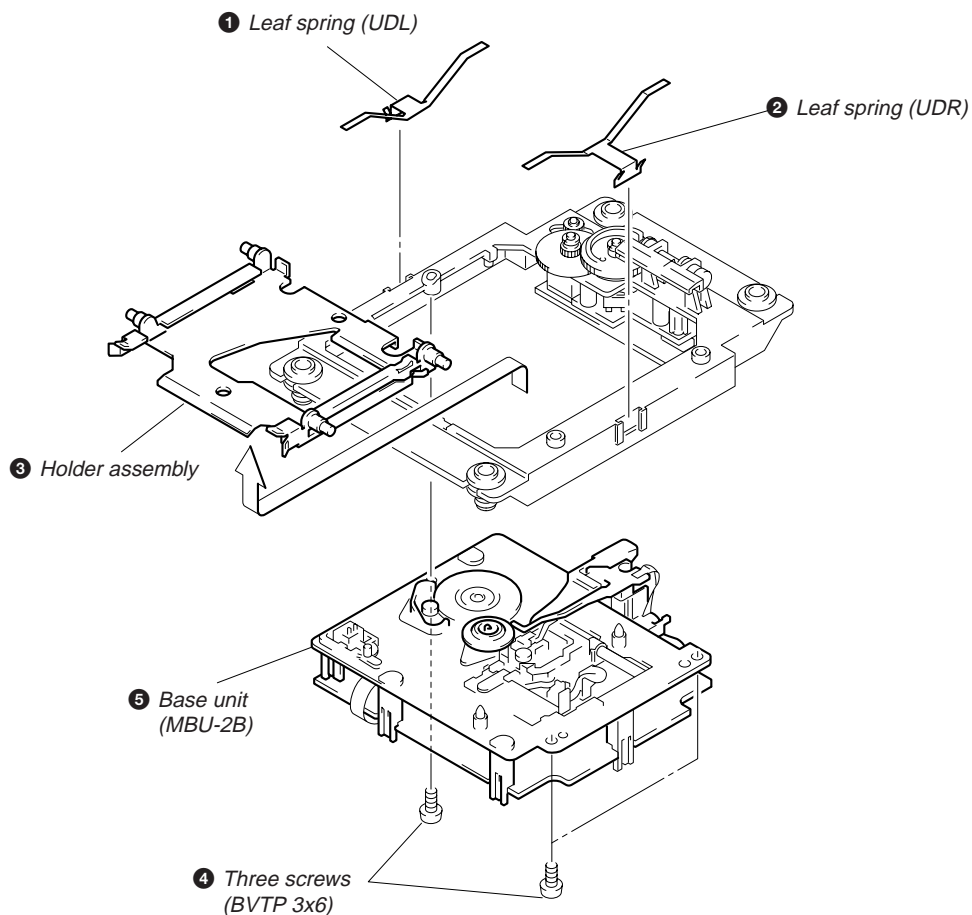
3-2. BRACKET (MOTOR) ASSY



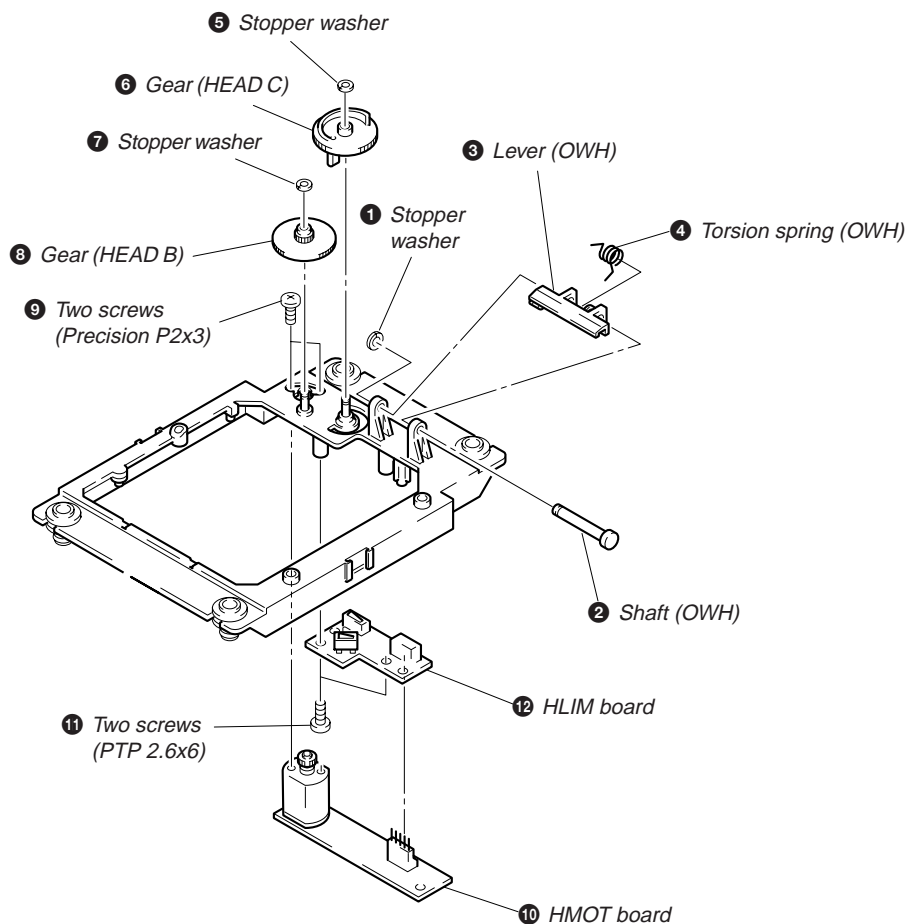
3-3. HOLDER ASSY



3-4. BASE UNIT



3-5. HMOT BOARD AND HLIM BOARD



SECTION 4 TEST MODE

4-1. Setting the Test Mode

While pressing the AMS knob, insert the power plug into the power supply inlet, and release the AMS knob.

4-2. Exiting the Test Mode

Press the REPEAT button. Unplug the power plug from an outlet.

4-3. Basic Operations of the Test Mode

All operations are performed using the AMS knob, YES button, and NO button.
The functions of these buttons are as follows.

Function	Contents
AMS knob	Changes parameters and modes
YES button	Proceeds onto the next step. Finalizes input.
NO button	Returns to previous step. Stops operations.

4-4. Selecting the Test Mode

Eight test modes are selected by turning the AMS knob.

Display	Contents
TEMP ADJUS	Temperature compensation offset adjustment
LDPWR ADJUS	Laser power adjustment
EFBAL ADJUS	Traverse adjustment
FBIAS ADJUS	Focus bias adjustment
FBIAS CHECK	Focus bias check
CPLAY MODE	Continuous playback mode
CREC MODE	Continuous recording mode
EP MODE	Non-volatile memory mode *

For detailed description of each adjustment mode, refer to 5. Electrical Adjustments.

If a different adjustment mode has been selected by mistake, press the NO button to exit from it.

* The EP MODE is not used in servicing. If set accidentally, press the NO button immediately to exit it.

4-4-1. Operating the Continuous Playback Mode

1. Entering the continuous playback mode

- ① Set the disc in the unit (either MO or CD).(MO: Recordable disc, CD: Disc for playback only).
- ② Rotate the AMS knob and display “CPLAY MODE”.
- ③ Press the YES button to change the display to “CPLAY IN”.
- ④ When access completes, the display changes to “C1 = 0000 AD = 00”.

Note : The “0” displayed are arbitrary numbers.

2. Changing the parts to be played back

- ① Press the YES button during continuous playback to change the display to “CPLAY MID”, “CPLAY OUT”.
- When pressed another time, the parts to be played back can be changed.
- ② When access completes, the display changes to “C1 = 0000 AD = 00”.

Note : The “0” displayed are arbitrary numbers.

3. Ending the continuous playback mode

- ① Press the NO button. The display will change to “CPLAY MODE”.
- ② Press the OPEN/CLOSE button and remove the disc.

Note 1 : The playback start addresses for IN, MID, and OUT are as follows.

IN 40h cluster
MID 300h cluster
OUT 700h cluster

4-4-2. Operating the Continuous Recording Mode

1. Entering the continuous recording mode

- ① Set the MO disc in the unit.
- ② Rotate the AMS knob and display “CREC MODE”.
- ③ Press the YES button to change the display to “CREC IN”.
- ④ When access completes, the display changes to “CREC (0000)” and **REC** lights up.

Note : The “0” displayed are arbitrary numbers.

2. Changing the parts to be recorded


- ① When the YES button is pressed during continuous recording, the display changes to “CREC MID”, “CREC OUT” and **REC** goes off.

When pressed another time, the parts to be recorded can be changed.

- ② When access completes, the display changes to “CREC (0000)” and **REC** lights up.

Note : The “0” displayed are arbitrary numbers.

3. Ending the continuous recording mode

- ① Press the NO button. The display changes to “CREC MODE” and **REC** goes off.
- ② Press the  OPEN/CLOSE button and remove the disc.

Note 1 : The recording start addresses for IN, MID, and OUT are as follows.

IN 40h cluster
MID 300h cluster
OUT 700h cluster

Note 2 : The NO button can be used to stop recording anytime.

Note 3 : During the test mode, the erasing-protection tab will not be detected. Therefore be careful not to set the continuous recording mode when a disc not to be erased is set in the unit.

Note 4 : Do not perform continuous recording for long periods of time above 5 minutes.






Note 5 : During continuous recording, be careful not to apply vibration.


4-4-3. Non-Volatile Memory Mode

This mode reads and writes the contents of the non-volatile memory.

It is not used in servicing. If set accidentally, press the NO button immediately to exit it.

4-5. Functions of Other buttons

Function	Contents
	Sets continuous playback when pressed in the STOP state. When pressed during continuous playback, the tracking servo turns ON/OFF.
	Stops continuous playback and continuous recording.
	The sled moves to the outer circumference only when this is pressed.
	The sled moves to the inner circumference only when this is pressed.
	Turns recording ON/OFF when pressed during continuous playback.
SCROLL/ CLOCK SET	Switches between the pit and groove modes when pressed.
PLAY MODE	Switches the spindle servo mode (CLVS and A).
DISPLAY/ CHAR	Switches the display when pressed>Returns to previous step. Stops operations.

Note : The erasing-protection tab is not detected during the test mode. Recording will start regardless of the position of the erasing-protection tab when the  button is pressed.

4-6. Test Mode Displays

Each time the DISPLAY/CHAR button is pressed, the display changes in the following order.

MODE display → Error rate display → Address display

1. MODE display

Displays “TEMP ADJUS”, “CPLAY MODE”, etc.

2. Error rate display

Error rates are displayed as follows.

C1 = 0000 AD = 0000

C1 = : Indicates C1 error

AD = : Indicates ADER

3. Address display

Addresses are displayed as follows.

“h = 0000 s = 0000” (MO pit and CD)

“h = 0000 a = 0000” (MO groove)

h = : Header address

s = : SUBQ address

a = : ADIP address

* “—” is displayed when the address cannot be read.

4-7. Meanings of Other Displays

Display	Contents		
	Light	Off	Blinking
▷	During continuous playback	STOP	
II	Tracking servo OFF	Tracking servo ON	
REC	Recording mode ON	Recording mode OFF	
CLOCK	CLV LOCK	CLV UNLOCK	
TRACK	Pit	Groove	
DISC	High reflection	Low reflection	
DATE	CLV-S	CLV-A	
A. SPACE	ABCD adjustment completed		
A – B	<div> (Focus auto gain successful Tracking auto gain successful) </div>		<div> (Focus auto gain successful Tracking auto gain failed) </div>

4-8. Precautions for Use of Test Mode

- ① As loading related operations will be performed regardless of the test mode operations being performed, be sure to check that the disc is stopped before setting and removing it.

Even if the OPEN/CLOSE button is pressed while the disc is rotating during continuous playback, continuous recording, etc., the disc will not stop rotating.

Therefore, it will be ejected while rotating.

Always press the NO button first before pressing the OPEN/CLOSE button.

- ② The erasing-protection tab is not detected in the test mode. Therefore, when modes which output the recording laser power such as continuous recording mode and traverse adjustment mode, etc. are set, the recorded contents will be erased regardless of the position of the tab. When using a disc that is not to be erased in the test mode, be careful not to enter the continuous recording mode and traverse adjustment mode.

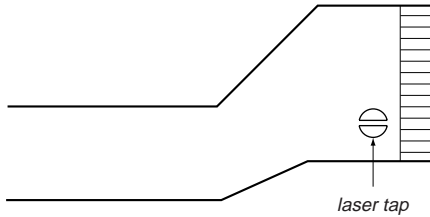
SECTION 5 ELECTRICAL ADJUSTMENTS

Precautions for Checking Laser Diode Emission

To check the emission of the laser diode during adjustments, never view directly from the top as this may lose your eye-sight.

Precautions for Use of optical pick-up (KMS-210A)

As the laser diode in the optical pick-up is easily damaged by static electricity, solder the laser tap of the flexible board when using it. Before disconnecting the connector, desolder first. Before connecting the connector, be careful not to remove the solder. Also take adequate measures to prevent damage by static electricity. Handle the flexible board with care as it breaks easily.



Optical pick-up flexible board

- Abbreviation
MO: Recordable disc
CD: Disc for playback only

Precautions for Adjustments

1) When replacing the following parts, perform the adjustments and checks with ○ in the order shown in the following table.

	Optical Pick-up	BD Board		
		IC171	D101	IC101, IC121, IC191
1. Temperature compensation offset adjustment	×	○	○	○
2. Laser power adjustment	○	×	×	○
3. Traverse adjustment	○	○	×	○
4. Focus bias adjustment	○	○	×	○
5. Error rate check	○	○	×	○

- 2) Set the test mode when performing adjustments.
After completing the adjustments, exit the test mode.
- 3) Perform the adjustments in the order shown.
- 4) Use the following tools and measuring devices.
 - Check Disc (MD) TDYS-1 (Parts No. 4-963-646-01)
 - Laser power meter LPM-8001 (Parts No. J-2501-046-A)
 - Oscilloscope
 - Digital voltmeter
 - Thermometer
- 5) When observing several signals on the oscilloscope, etc., make sure that VC and ground do not connect inside the oscilloscope.
(VC and ground will become short-circuited.)

Creating Continuously Recorded Disc

* This disc is used in focus bias adjustment and error rate check.
The following describes how to create a continuous recording disc.

1. Insert a MO disc (blank disc) commercially available.
2. Rotate the AMS knob and display "CREC MODE".
3. Press the YES button and display "CREC IN".
4. Press the YES button again to display "CREC MID".
"CREC (0300)" is displayed for a moment and recording starts.
5. Complete recording within 5 minutes.
6. Press the NO button and stop recording.
7. Press the \triangle OPEN/CLOSE button and remove the MO disc.

The above has been how to create a continuous recording data for the focus bias adjustment and error rate check.

Note :

- Be careful not to apply vibration during continuous recording.

Temperature Compensation Offset Adjustment

Save the temperature data at that time in the non-volatile memory as 25 °C reference data.

Note :

1. Usually, do not perform this adjustment.
2. Perform this adjustment in an ambient temperature of 22 °C to 28 °C. Perform it immediately after the power is turned on when the internal temperature of the unit is the same as the ambient temperature.
3. When D101 has been replaced, perform this adjustment after the temperature of this part has become the ambient temperature.

Adjusting Method :

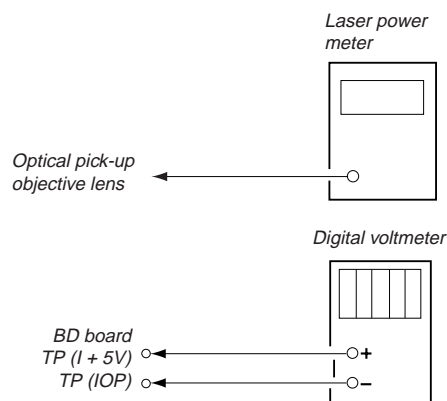
1. Rotate the AMS knob and display "TEMP ADJUS".
2. Press the YES button and select the "TEMP ADJUS" mode.
3. "TEMP = 000" and the current temperature data will be displayed.
4. To save the data, press the YES button.
When not saving the data, press the NO button.
5. When the YES button is pressed, "TEMP = 000 SAV" will be displayed for some time, followed by "TEMP ADJUS".
When the NO button is pressed, "TEMP ADJUS" will be displayed.

Specifications :

The "TEMP = 000" should be within "E0 - EF", "F0 - FF", "00 - 0F", "10 - 1F" and "20 - 2F".

Laser Power Adjustment

Connection :



Adjusting Method :

1. Set the laser power meter on the objective lens of the optical pick-up. (When it cannot be set properly, press the ◀ button or ▶ button and move the optical pick-up.)
Connect the digital volt meter to TP (IOP) and TP (I+5V).
2. Rotate the AMS knob and display "LDPWR ADJUS".
(Laser power : For adjustment)
3. Press the YES button twice and display "LD \$ 4B = 3.5 m".
4. Adjust RV102 of the BD board so that the reading of the laser power meter becomes $3.4^{+0.1}_{-0}$ mW.
5. Press the YES button and display "LD \$ 96 = 7.0 m".
(Laser power : MO writing)
6. Check that the laser power meter and digital voltmeter readings satisfy the specified value.

Specification :

Laser power meter reading : 7.0 ± 0.3 mW

Digital voltmeter reading : Optical pickup displayed value $\pm 10\%$

(Optical pickup label)



$I_{op} = 82.5$ mA in this case

$I_{op} \text{ (mA)} = \text{Digital voltmeter reading (mV)} / 1 \text{ (}\Omega\text{)}$

7. Press the YES button and display "LD \$ 0F = 0.7 m".
(Laser power : MO reading)
8. Check that the laser power meter at this time satisfies the specified value.

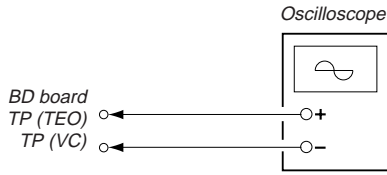
Specification :

Laser power meter reading : 0.70 ± 0.1 mW

9. Press the NO button and display "LDPWR ADJUS", and stop laser emission.
(The NO button is effective at all times to stop the laser emission.)

Traverse Adjustment

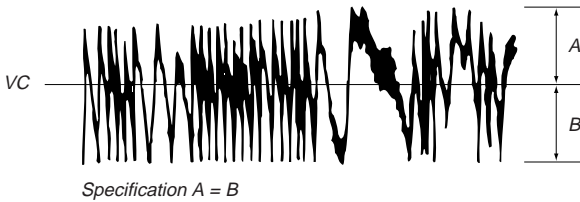
Connection :



Adjusting method :

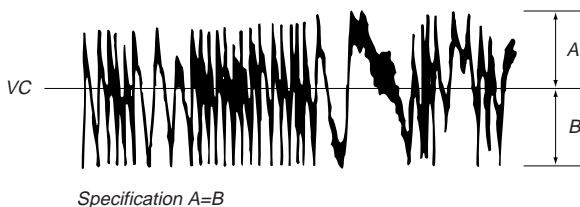
1. Connect an oscilloscope to TP (TEO) and TP (VC) of the BD board.
2. Load a MO disc (any available on the market).
3. Press the ◀◀ button or ▶▶ button and move the optical pick-up outside the pit.
4. Rotate the AMS knob and display "EFBAL ADJUS".
5. Press the YES button and display "EFBAL MO-W".
(Laser power WRITE power/Focus servo ON/tracking servo OFF/spindle (S) servo ON)
6. Adjust RV101 of the BD board so that the waveform of the oscilloscope becomes the specified value.
(MO groove write power traverse adjustment)

(Traverse Waveform)



7. Press the YES button and display "EFB = \$ ◻ MO-R".
(Laser power : MO reading)
8. Rotate the AMS knob so that the waveform of the oscilloscope becomes the specified value.
(When the AMS knob is rotated, the ◻ of "EFB = \$ ◻" changes and the waveform changes.) In this adjustment, waveform varies at intervals of approx. 3%. Adjust the waveform so that the specified value is satisfied as much as possible.
(MO groove read power traverse adjustment)

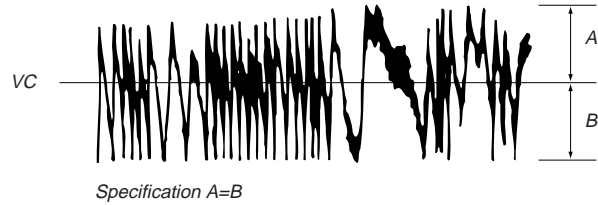
(Traverse Waveform)



9. Press the YES button, display "EFB = \$ ◻ SAV" for a moment and save the adjustment results in the non-volatile memory.
Next "EFBAL MO-P" is displayed.
10. Press the YES button and display "EFB = \$ ◻ MO-P".
The optical pick-up moves to the pit area automatically and servo is imposed.

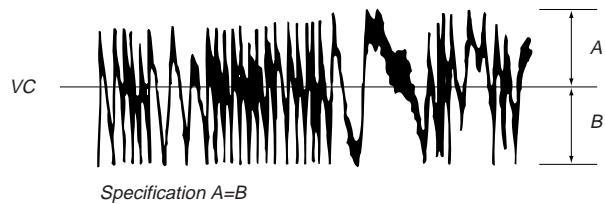
11. Rotate the AMS knob until the waveform of the oscilloscope moves closer to the specified value.
In this adjustment, waveform varies at intervals of approx. 3%. Adjust the waveform so that the specified value is satisfied as much as possible.

(Traverse Waveform)



12. Press the YES button, display "EFB = \$ ◻ SAV" for a moment and save the adjustment results in the non-volatile memory.
Next "EFBAL CD" is displayed. The disc stops rotating automatically.
13. Press the ≡OPEN/CLOSE button and remove the MO disc.
14. Load the check disc (MD) TDYS-1.
15. Press the YES button and display "EFB = \$ ◻ CD". Servo is imposed automatically.
16. Rotate the AMS knob so that the waveform of the oscilloscope moves closer to the specified value.
In this adjustment, waveform varies at intervals of approx. 3%. Adjust the waveform so that the specified value is satisfied as much as possible.

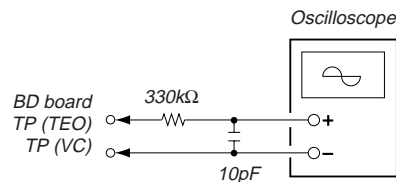
(Traverse Waveform)



17. Press the YES button, display "EFB = \$ ◻ SAV" for a moment and save the adjustment results in the non-volatile memory.
Next "EFBAL ADJUS" is displayed.
18. Press the ≡OPEN/CLOSE button and remove the test disc TDYS-1.

Note 1 : Data will be erased during MO reading if a recorded disc is used in this adjustment.

Note 2 : If the traverse waveform is not clear, connect the oscilloscope as shown in the following figure so that it can be seen more clearly.



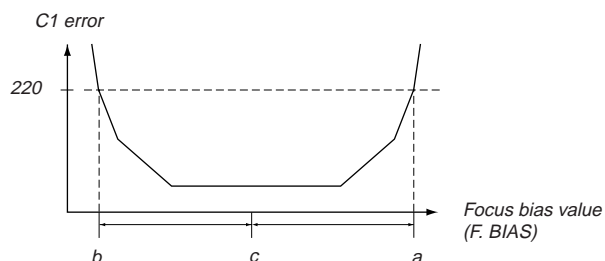
Focus Bias Adjustment

Adjusting Method :

1. Load a continuously recorded disc (Refer to “Page 32 Creating Continuously Recorded Disc”).
2. Rotate the AMS knob and display “CPLAY MODE”.
3. Press the YES button twice and display “CPLAY MID”.
4. Press the NO button when “C1 = 0000 AD = 00” is displayed.
5. Rotate the AMS knob and display “FBIAS ADJUS”.
6. Press the YES button and display “0000/00 a = 00”.
The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the 2 digits after [a =] indicate the focus bias value.
7. Rotate the AMS knob in the clockwise direction and find the focus bias value at which the C1 error rate becomes 220.
8. Press the YES button and display “0000/00 b = 00”.
9. Rotate the AMS knob in the counterclockwise direction and find the focus bias value at which the C1 error rate becomes 220.
10. Press the YES button and display “0000/00 c = 00”.
11. Check that the C1 error rate is below 50 and ADER is 00. Then press the YES button.
12. If the “(00” in “00 - 00 - 00 (00” is above 20, press the YES button.
If below 20, press the NO button and repeat the adjustment from step 2 again.
13. Press the NO button and press the \triangle OPEN/CLOSE button to remove the continuously recorded disc.

Note 1 : The relation between the C1 error and focus bias is as shown in the following figure. Find points a and b in the following figure using the above adjustment. The focal point position C is automatically calculated from points a and b.

Note 2 : As the C1 error rate changes, perform the adjustment using the average value.



Error Rate Check

CD Error Rate Check

Checking Method :

1. Load a check disc (MD) TDYS-1.
2. Rotate the AMS knob and display “CPLAY MODE”.
3. Press the YES button twice and display “CPLAY MID”.
4. “C1 = 0000 AD = 00” is displayed.
5. Check that the C1 error rate is below 20.
6. Press the NO button, stop playback, press the \triangle OPEN/CLOSE button, and remove the test disc.

MO Error Rate Check

Checking Method :

1. Load a continuously recorded disc (Refer to “Page 32 Creating Continuously Recorded Disc”).
2. Rotate the AMS knob and display “CPLAY MODE”.
3. Press the YES button twice and display “CPLAY MID”.
4. “C1 = 0000 AD = 00” is displayed.
5. If the C1 error rate is below 50, check that ADER is 00.
6. Press the NO button, stop playback, press the \triangle OPEN/CLOSE button, and remove the continuously recorded disc.

Focus Bias Check

Change the focus bias and check the focus tolerance amount.

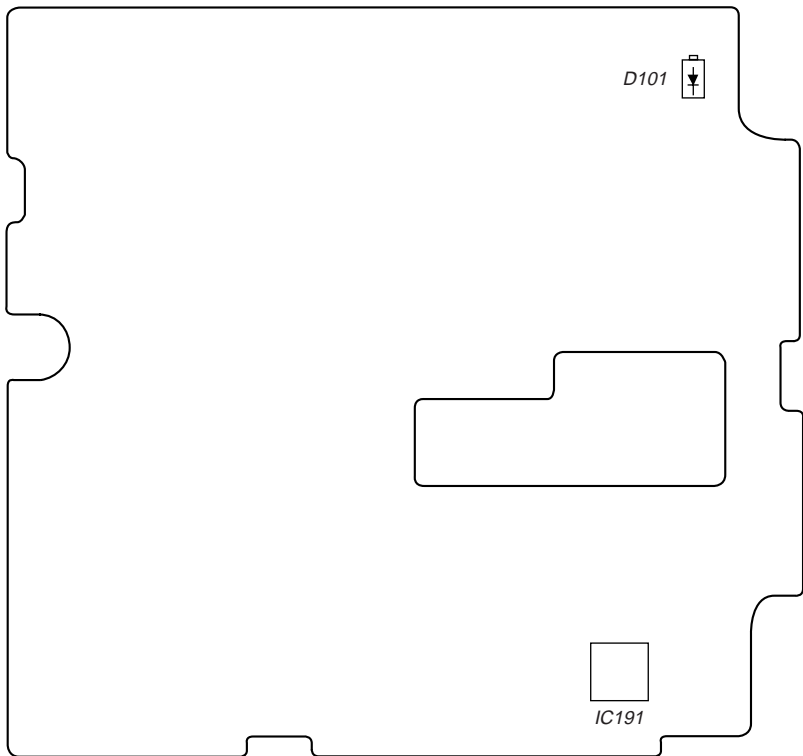
Checking Method :

1. Load a continuously recorded disc (Refer to “Page 32 Creating Continuously Recorded Disc”).
2. Rotate the AMS knob and display “CPLAY MODE”.
3. Press the YES button twice and display “CPLAY MID”.
4. Press the NO button when “C1 = 0000 AD = 00” is displayed.
5. Rotate the AMS knob and display “FBIAS CHECK”.
6. Press the YES button and display “0000/00 c = 00”.
The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the 2 digits after [c =] indicate the focus bias value.
Check that the C1 error is below 50 and ADER is 00.
7. Press the YES button and display “0000/00 b = 00”.
Check that the C1 error is not below 220 and ADER is not above 00 every time.
8. Press the YES button and display “0000/00 a = 00”.
Check that the C1 error is not below 220 and ADER is not above 00 every time.
9. Press the NO button, next press the \triangle OPEN/CLOSE button, and remove the continuously recorded disc.

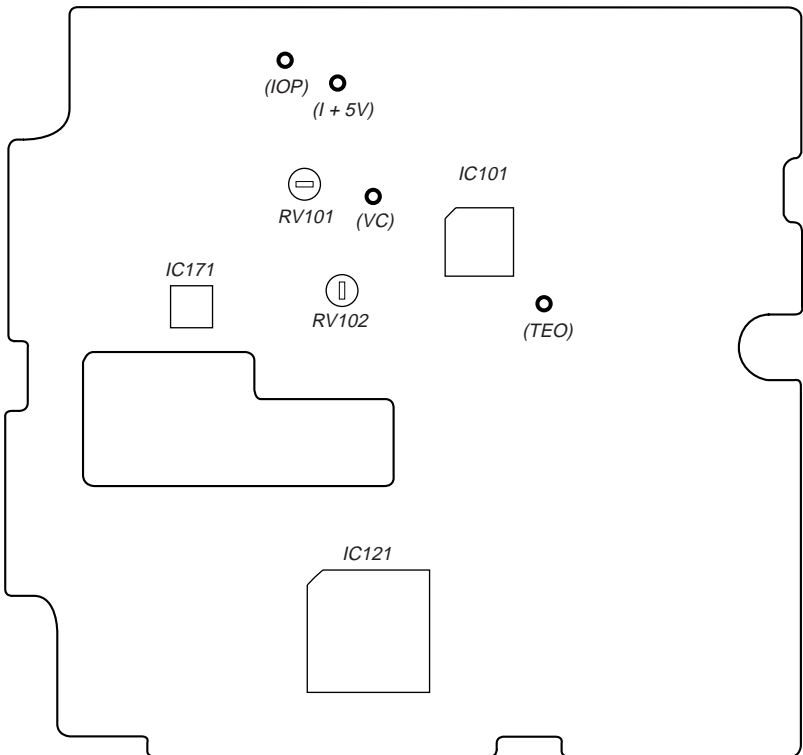
Note 1 : If the C1 error and ADER are above 00 at points a or b, the focus bias adjustment may not have been carried out properly. Adjust perform the beginning again.

Adjusting Points and Connecting Points

[BD BOARD] (SIDE A)



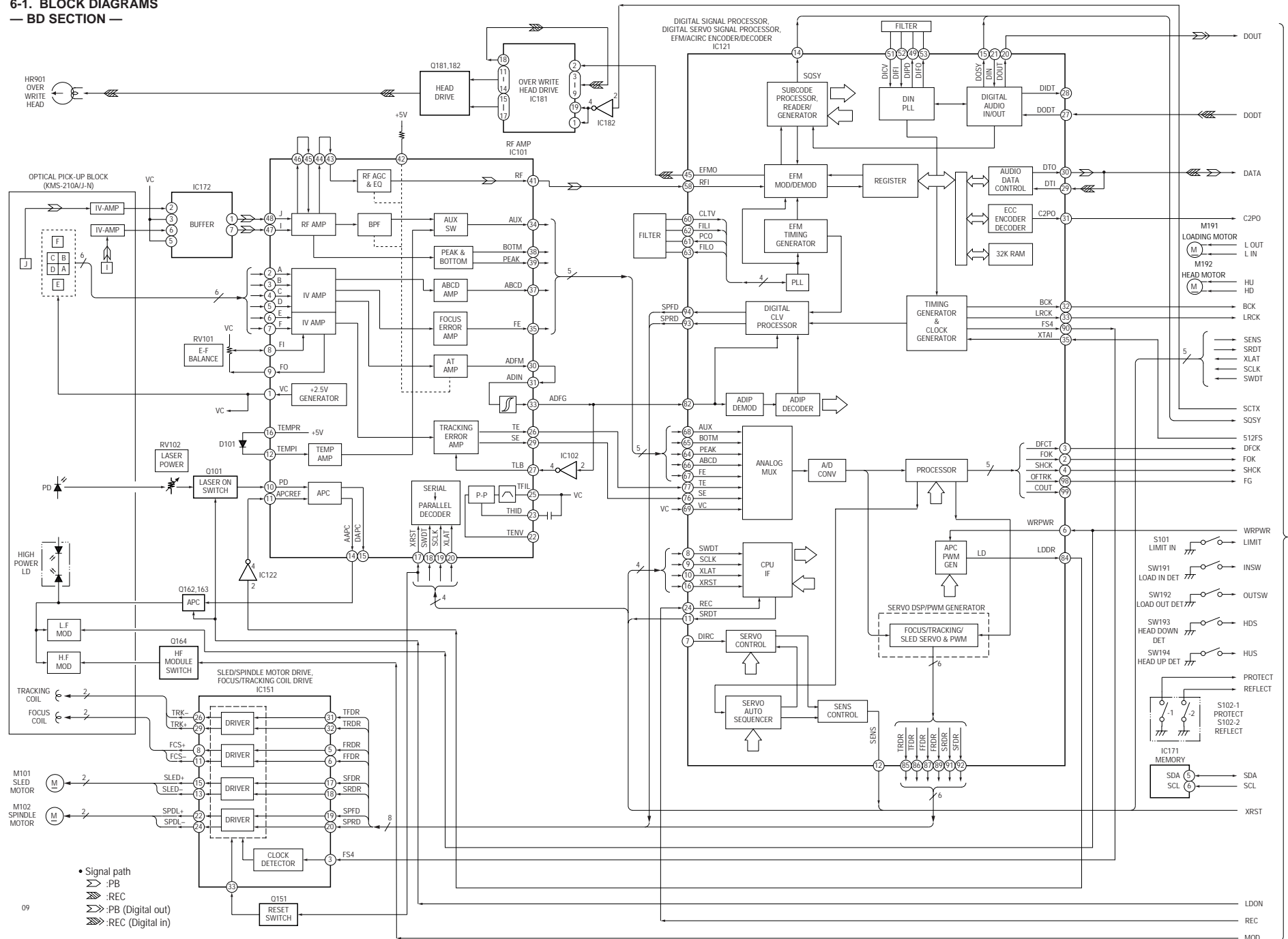
[BD BOARD] (SIDE B)



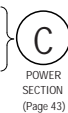
SECTION 6

DIAGRAMS

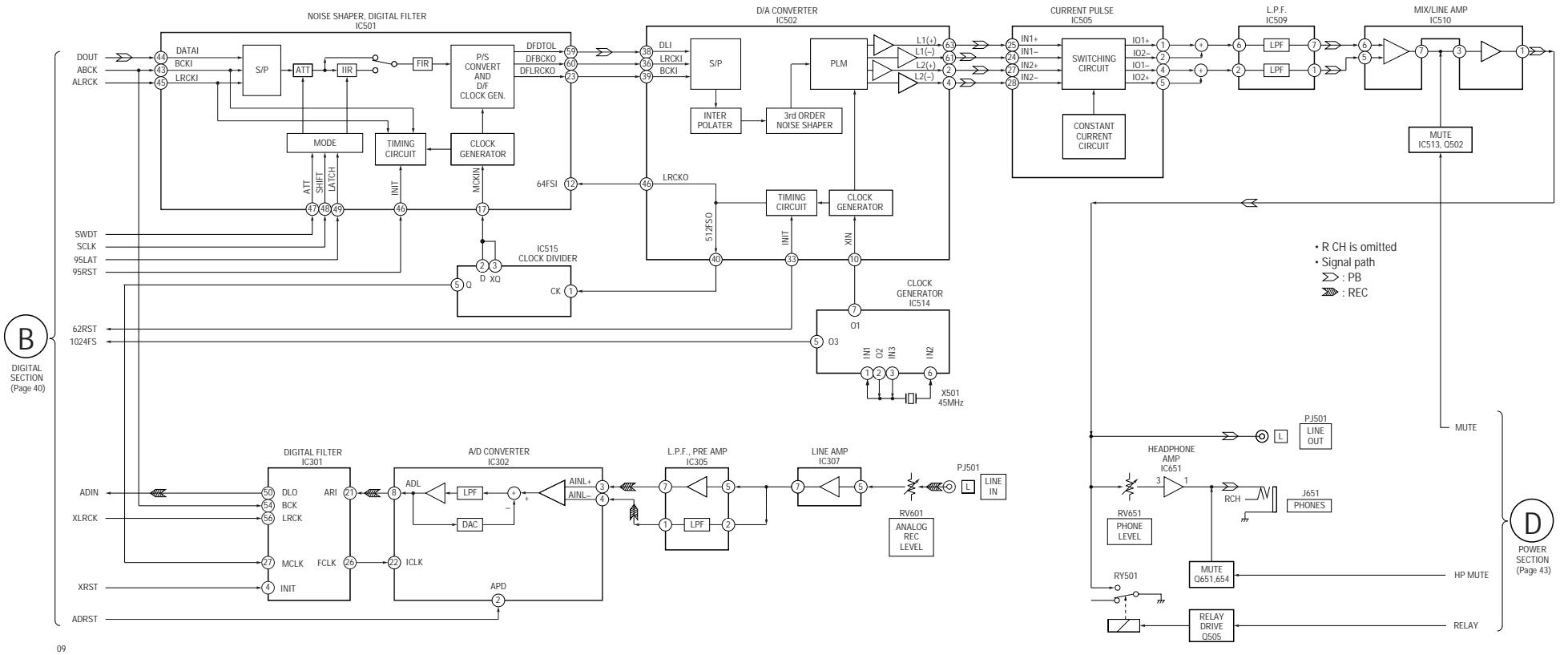
6-1. BLOCK DIAGRAMS — BD SECTION —



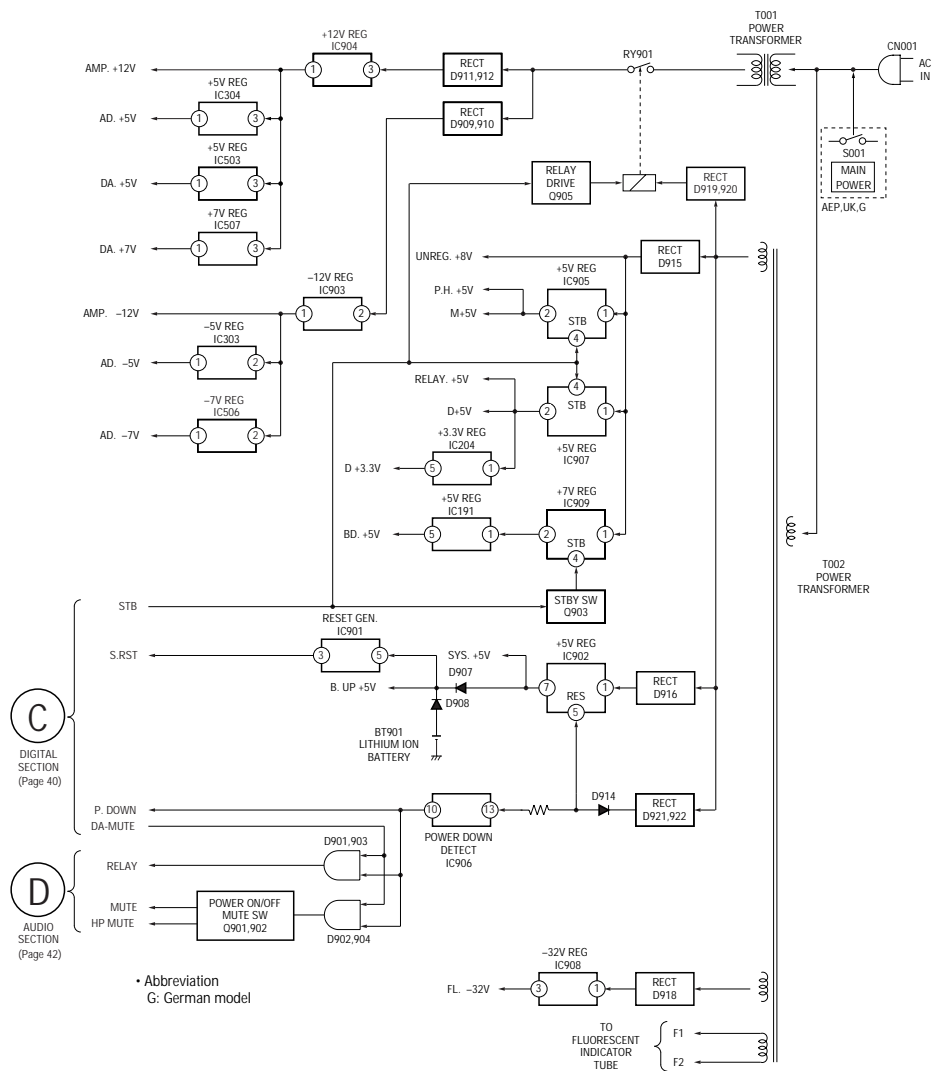
— DIGITAL SECTION —



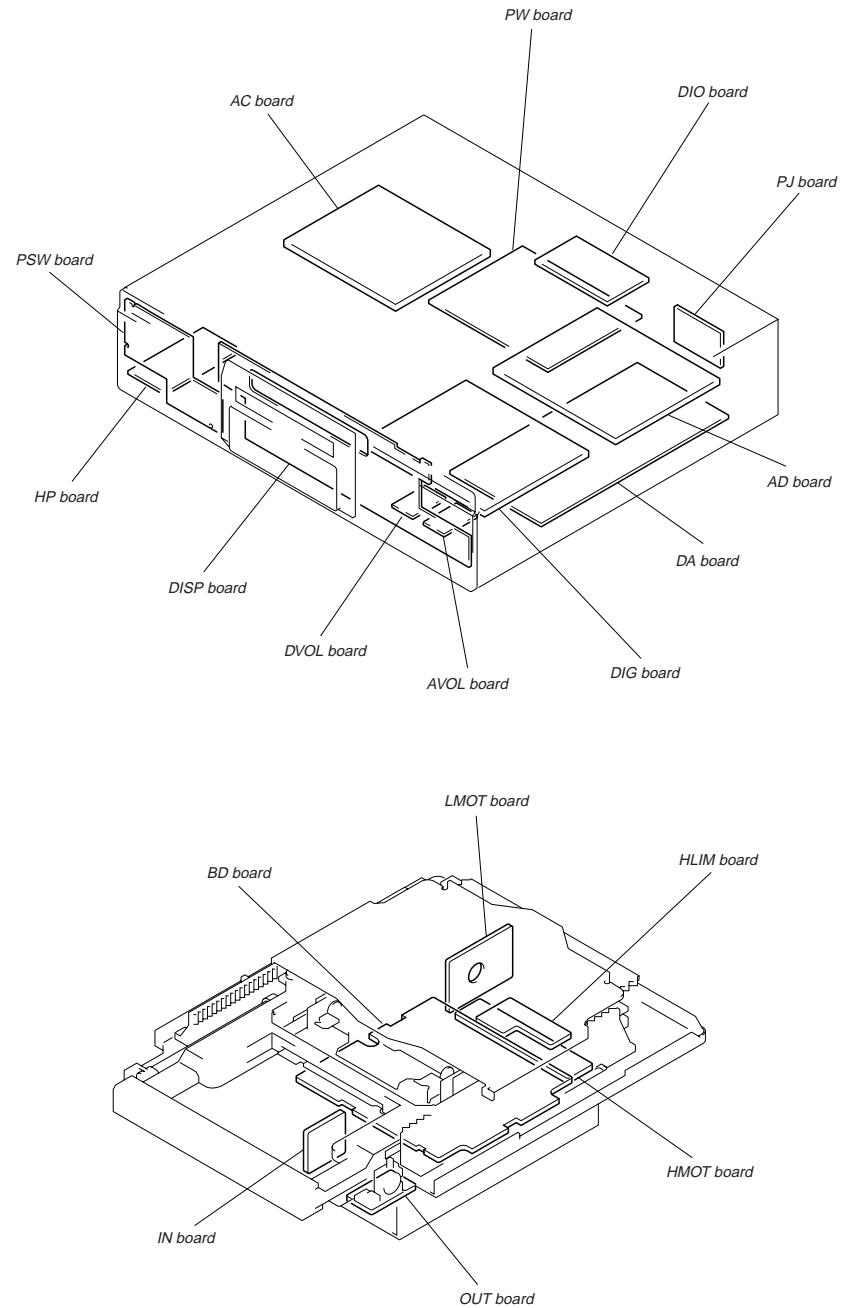
— AUDIO SECTION —



— POWER SECTION —

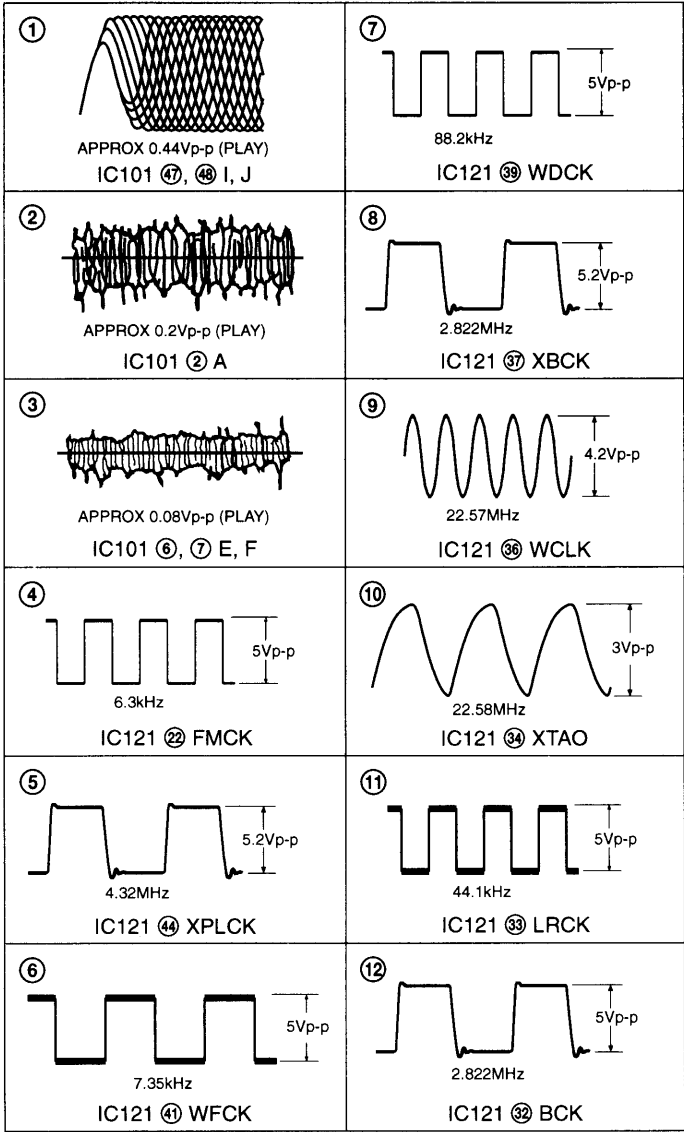


6-2. CIRCUIT BOARDS LOCATION

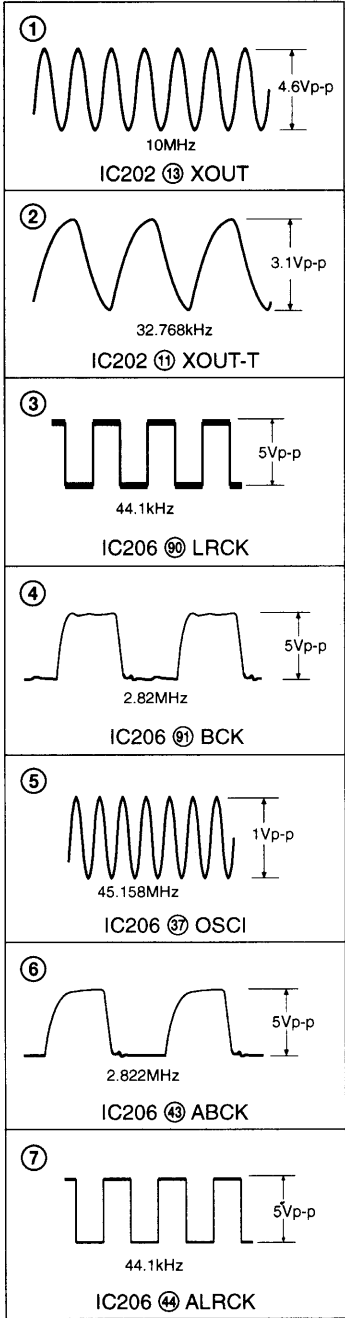


6-3. WAVEFORMS

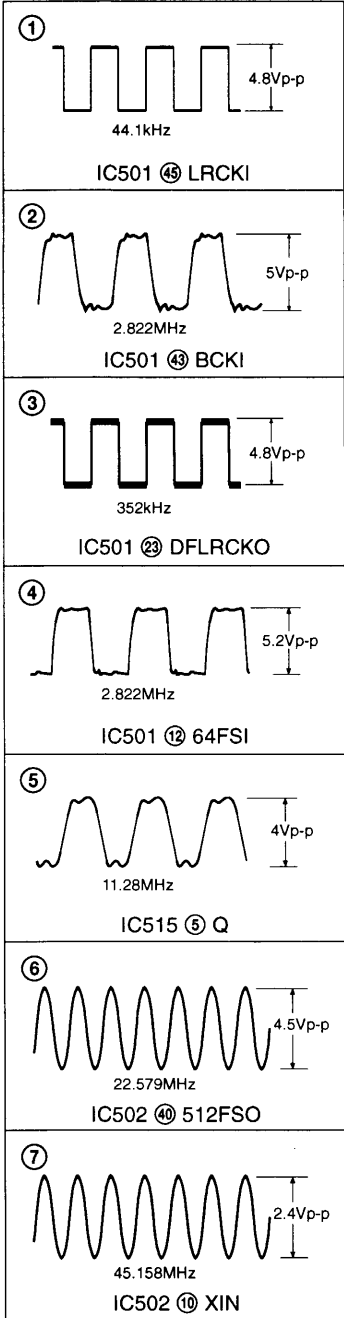
BD SECTION



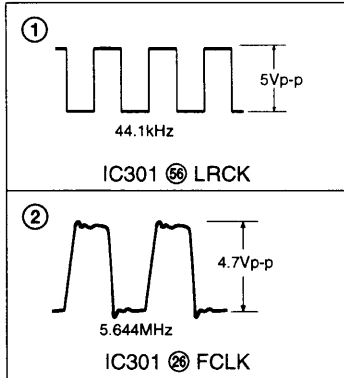
DIGITAL SECTION



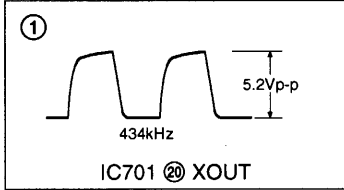
DA SECTION



AD SECTION



PANEL SECTION



THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

NOTE

- : parts extracted from the component side.
- : Through hole.
- ▨ : Pattern from the side which enable seeing.
- ▩ : Pattern of the rear side.

NOTE

- All capacitors are in μF unless otherwise noted. pF : μF
- 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ : internal component.
- : panel designation.

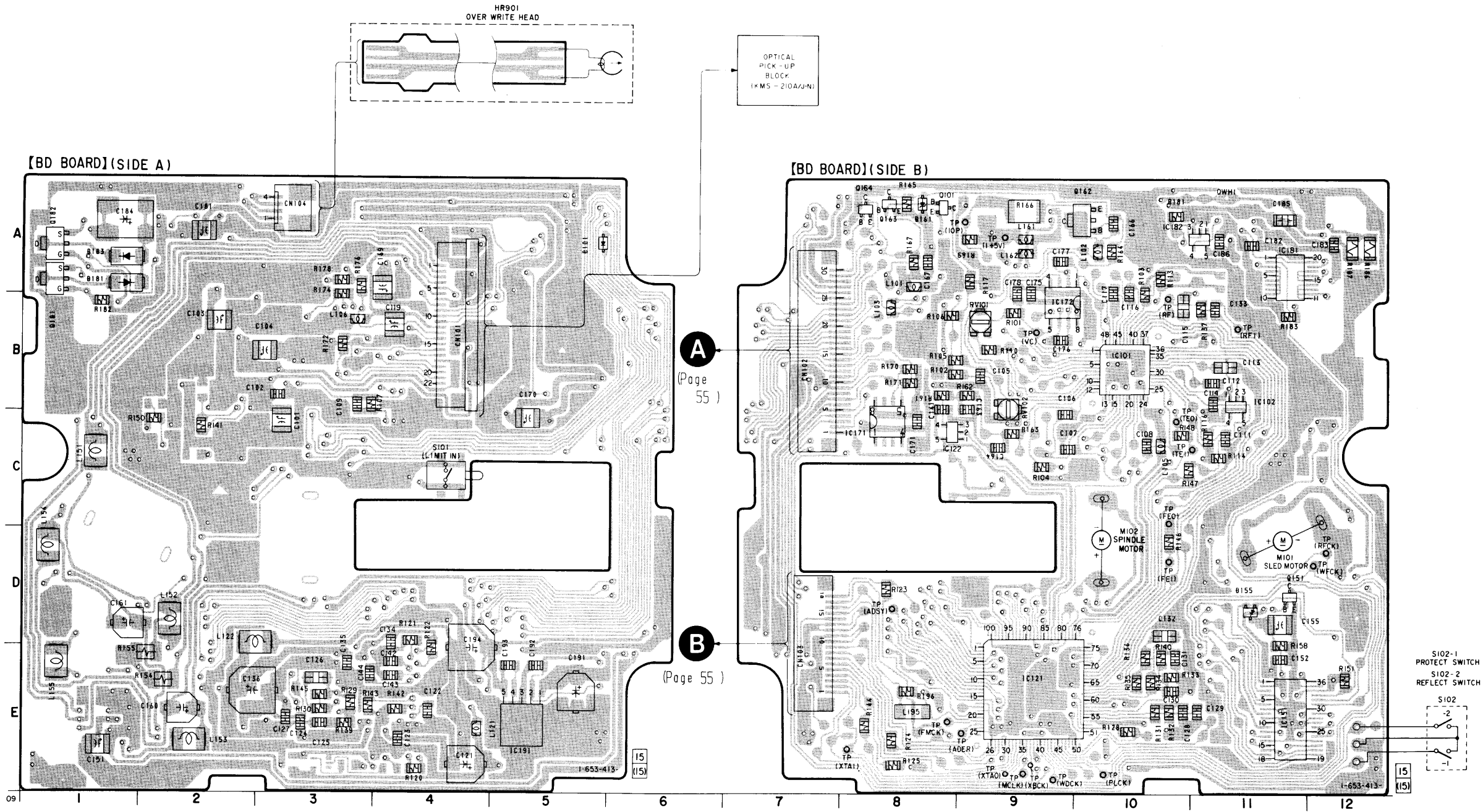
Note : The components identified by mark △ or dotted line with mark △ are critical for safety.
Replace only with part number specified.

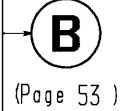
- B+ : B+ Line
- B- : B- Line
- : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
no mark : REC/PLAY
() : REC
< > : PLAY
* : can not be measured.
- Voltages are taken with a VOM (Input impedance 10M Ω).
Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
▨ : PB
▨▨ : PB (Digital out)
▨▨ : REC
▨▨ : REC (Digital in)
- Abbreviation
G : German model.

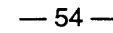
6-4. PRINTED WIRING BOARD — BD SECTION —
• See page 44 for Circuit Boards Location.

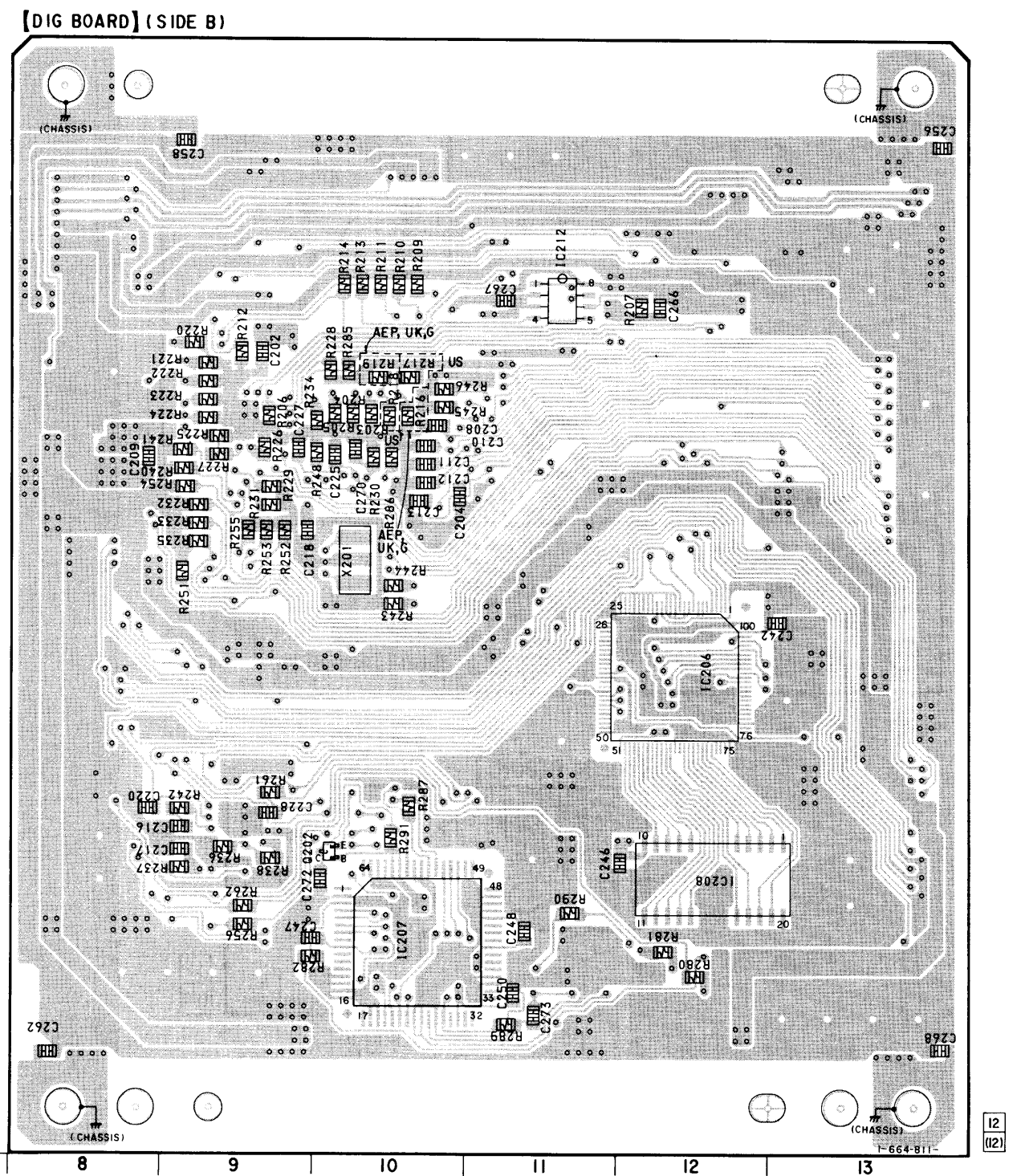
• Semiconductor
Location

Ref. No.	Location
D101	A-5
D155	D-11
D161	A-8
D181	A-1
D183	A-1
IC101	B-10
IC102	B-11
IC121	E-9
IC122	C-8
IC151	E-11
IC171	C-8
IC172	B-9
IC181	A-11
IC182	A-10
IC192	E-5
Q101	A-8
Q151	D-11
Q162	A-10
Q163	A-8
Q164	A-8
Q181	B-1
Q182	A-1



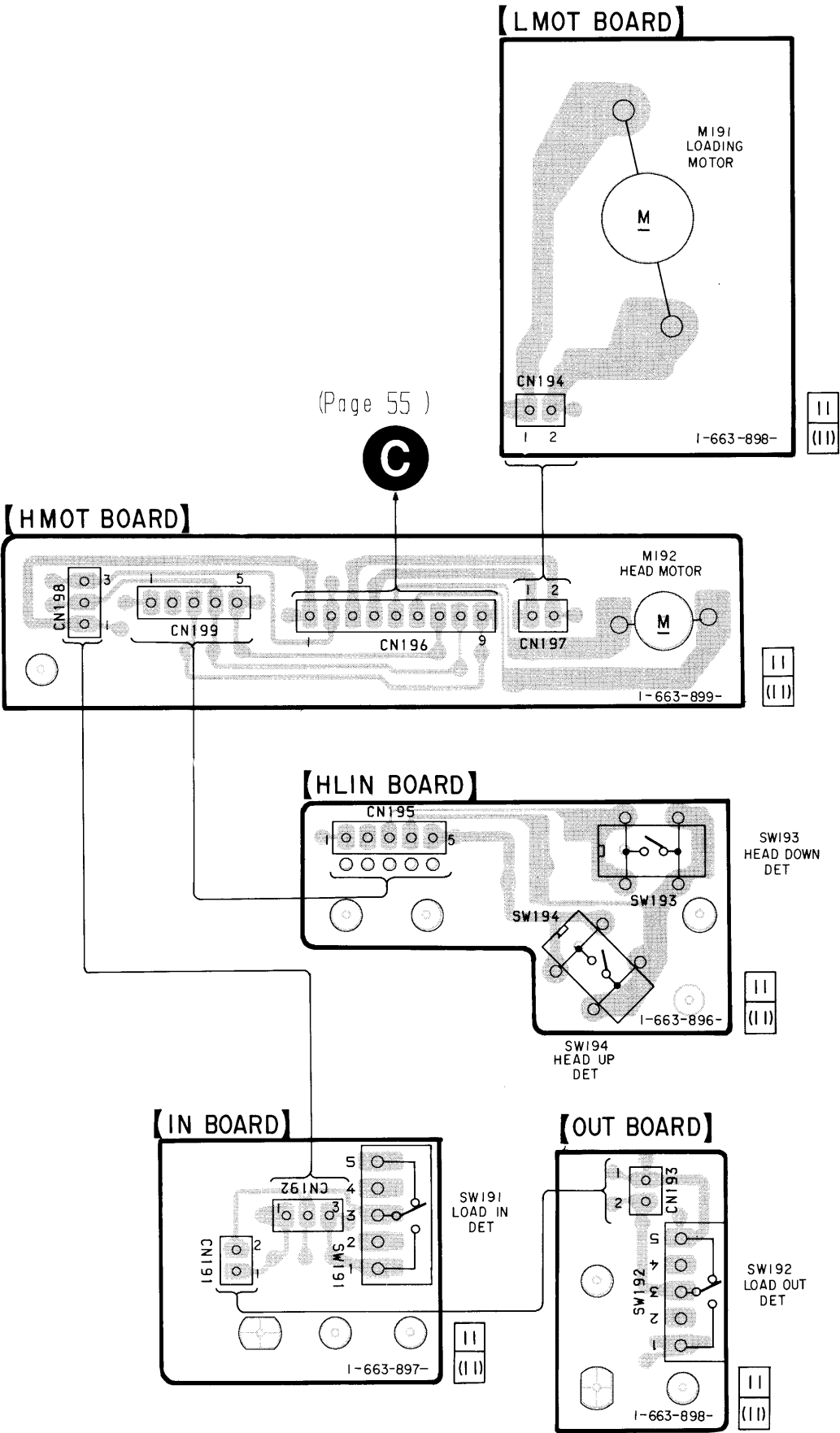




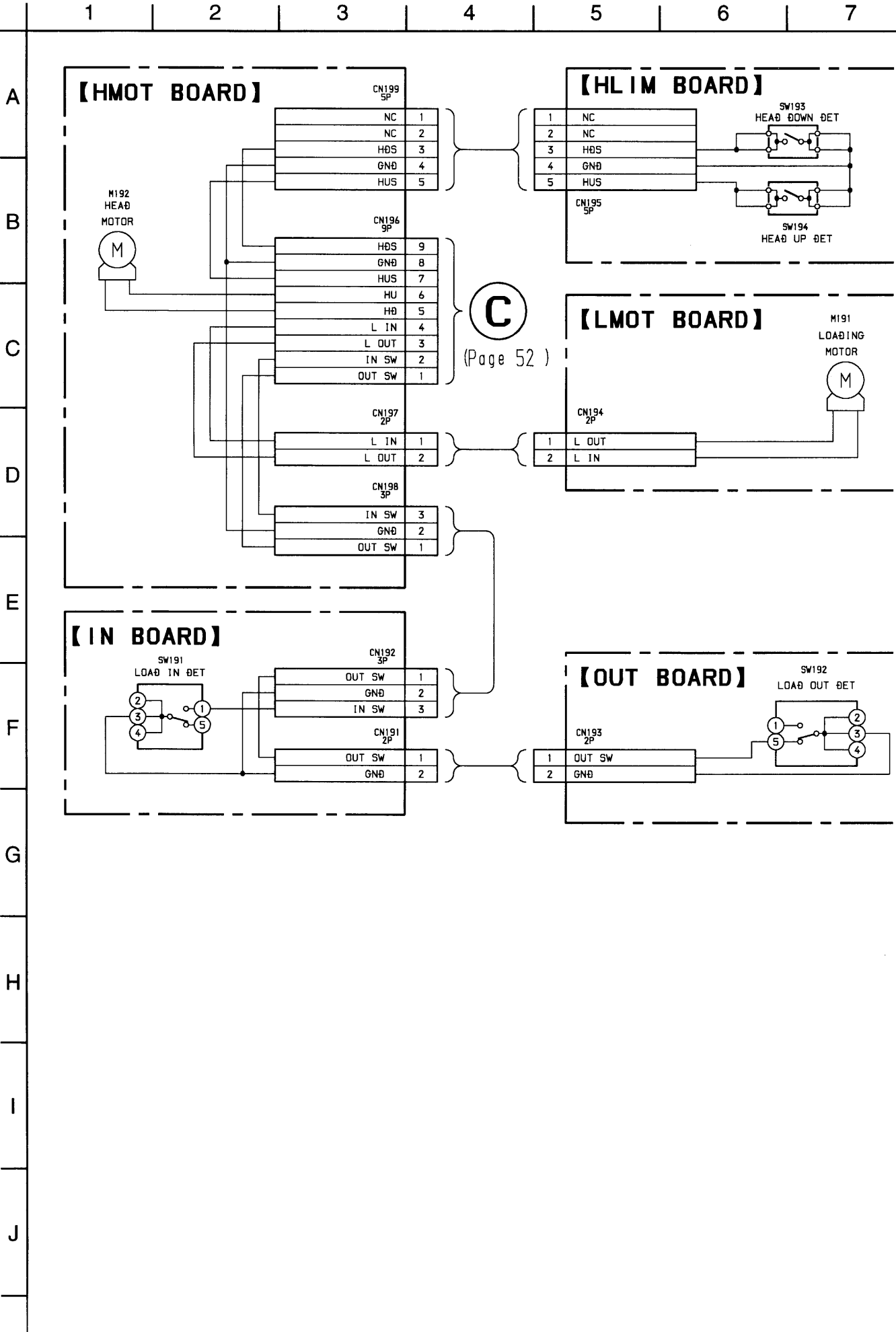


Ref. No.	Location	Ref. No.	Location
IC201	C-3	IC208	F-12
IC202	C-5	IC210	G-2
IC203	F-5	IC211	D-3
IC204	E-5	IC212	B-11
IC205	F-4		
IC206	E-12	Q201	G-5
IC207	G-10	Q202	F-10

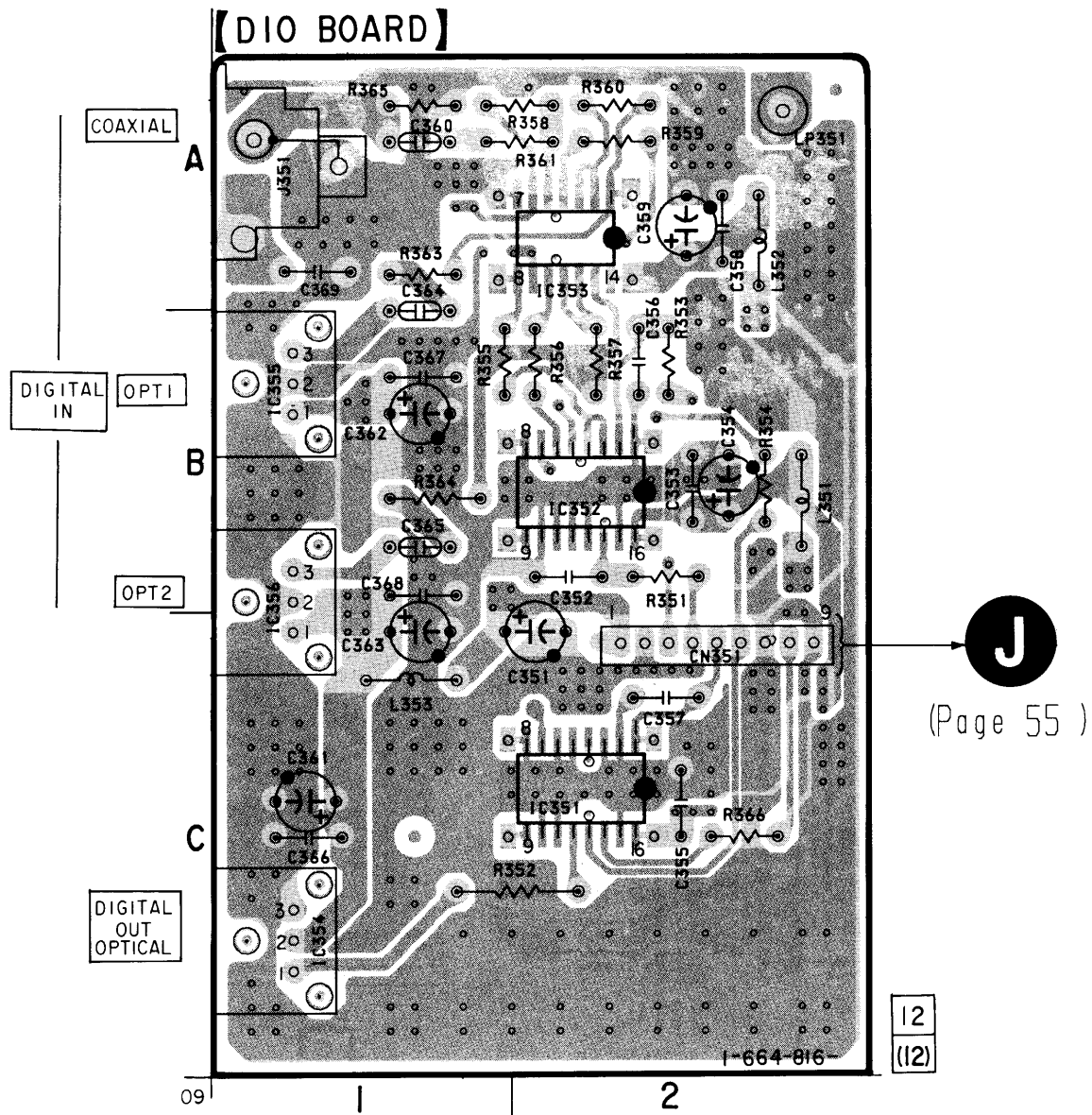
6-8. PRINTED WIRING BOARD — MD SECTION —
• See page 44 for Circuit Boards Location.



6-9. SCHEMATIC DIAGRAM — MD SECTION —

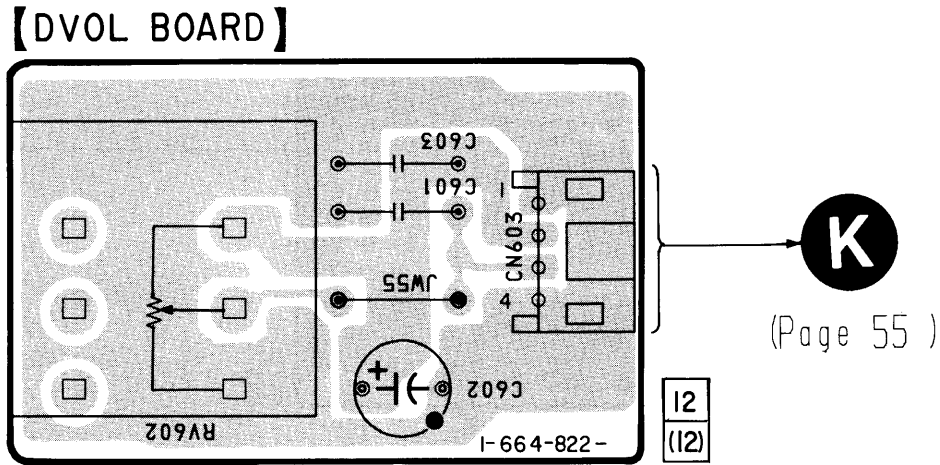


6-10. PRINTED WIRING BOARD — D OUT, D VOL SECTION —
• See page 44 for Circuit Boards Location.

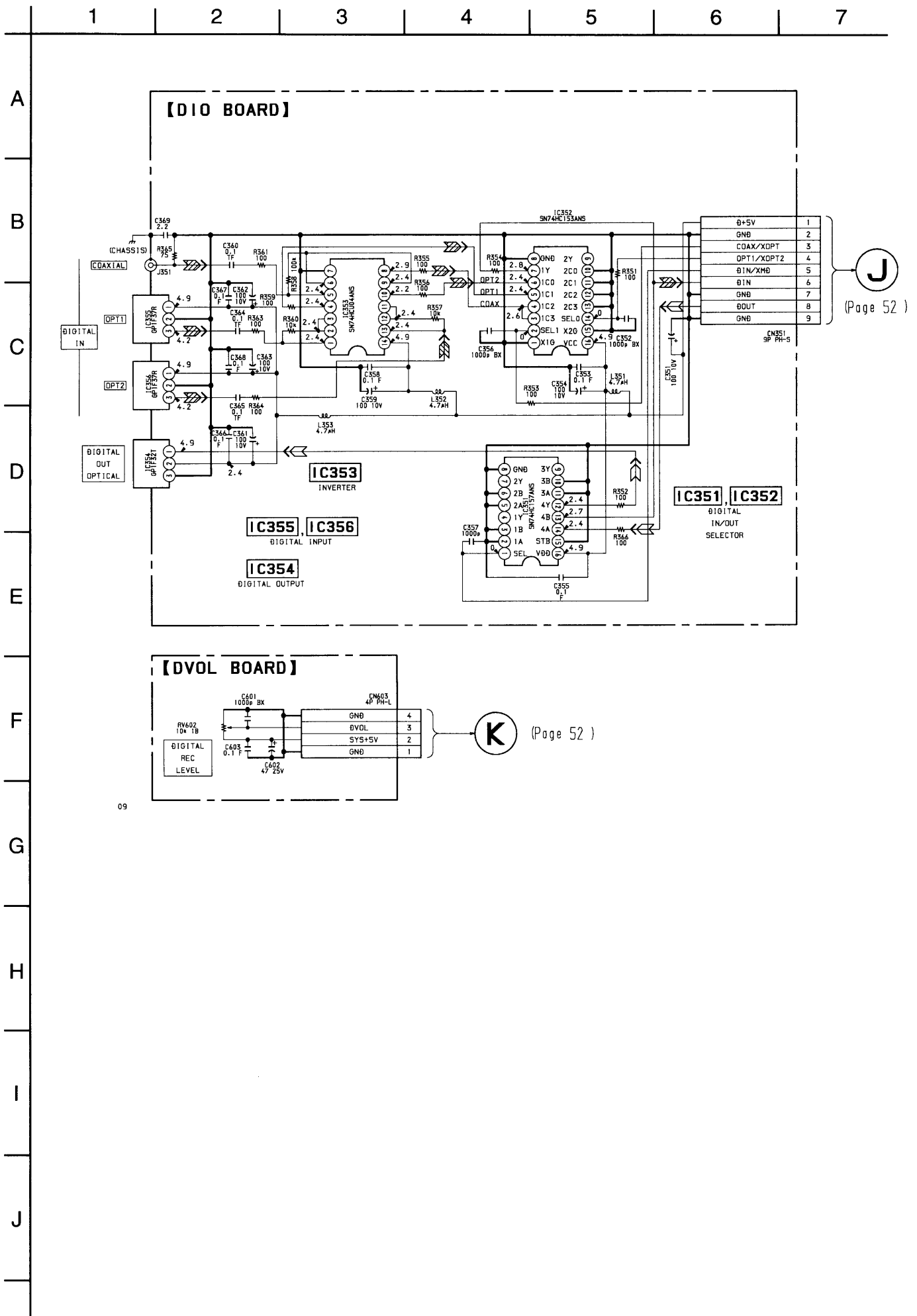


• Semiconductor Location

Ref. No.	Location
IC351	C-2
IC352	B-2
IC353	A-2
IC354	C-1
IC355	B-1
IC356	C-1



6-11. SCHEMATIC DIAGRAM — D OUT, D VOL SECTION —
• See page 81 for IC Block Diagrams.



6-12. PRINTED WIRING BOARD — DA SECTION —
• See page 44 for Circuit Boards Location.

— DA Board —

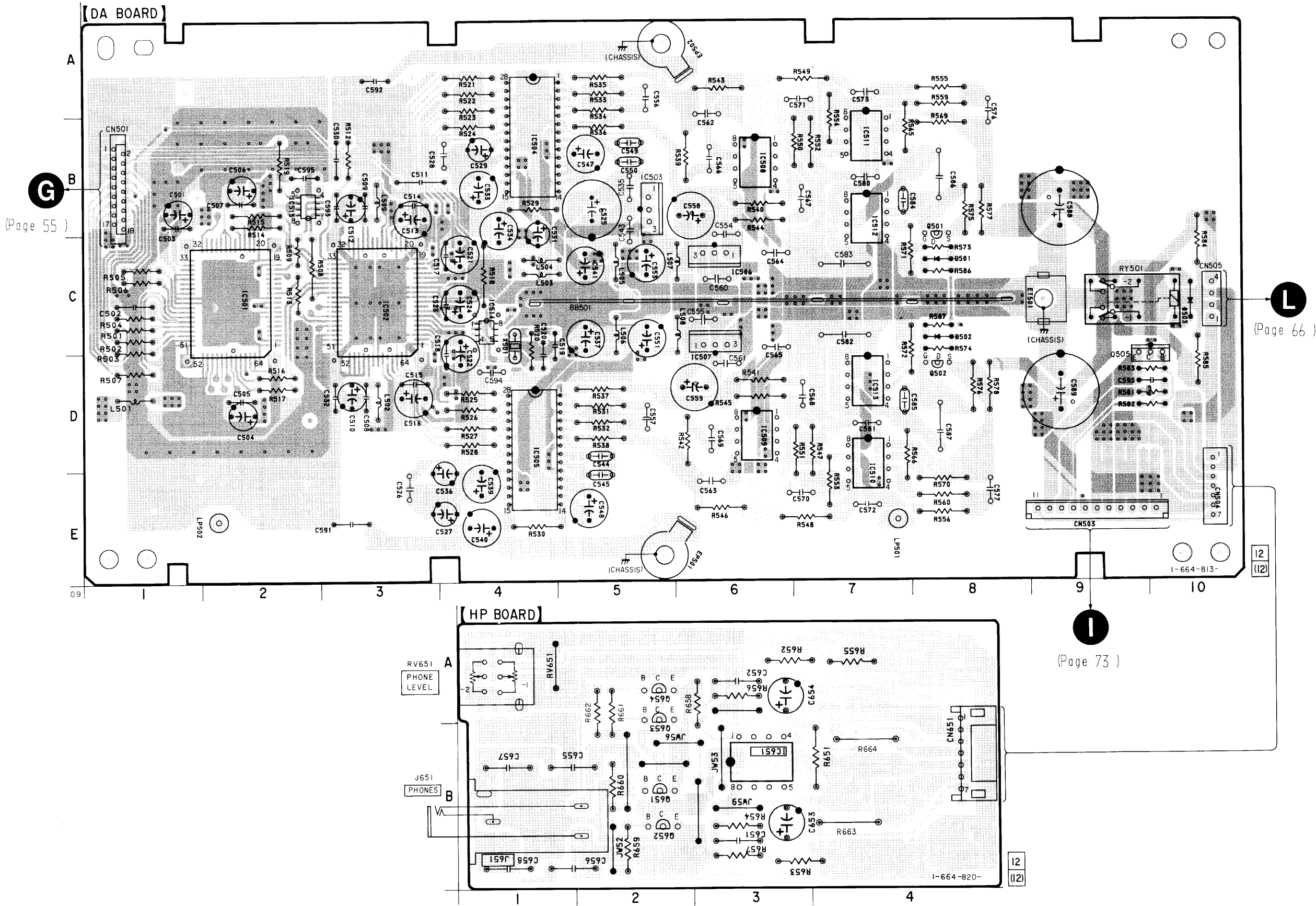
• Semiconductor Location

Ref. No.	Location
D501	C-8
D502	C-8
D503	C-10
IC501	C-2
IC502	C-3
IC503	B-5
IC504	B-4
IC505	D-4
IC506	C-6
IC507	D-6
IC508	B-6
IC509	D-6
IC510	D-7
IC511	B-7
IC512	B-7
IC513	D-7
IC514	C-4
IC515	B-2
Q501	B-8
Q502	D-8
Q505	C-9

— HP Board —

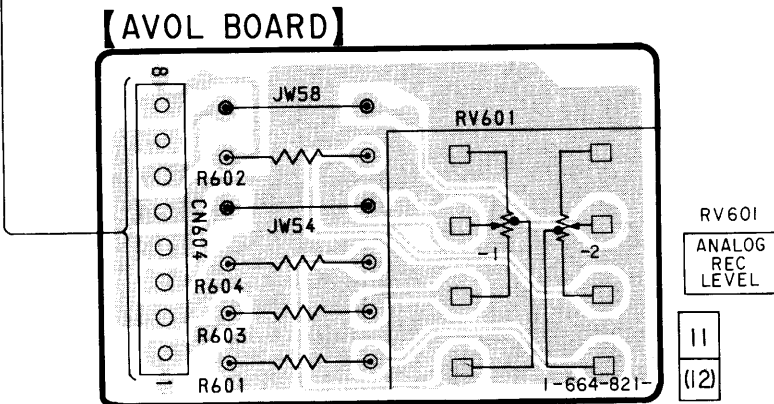
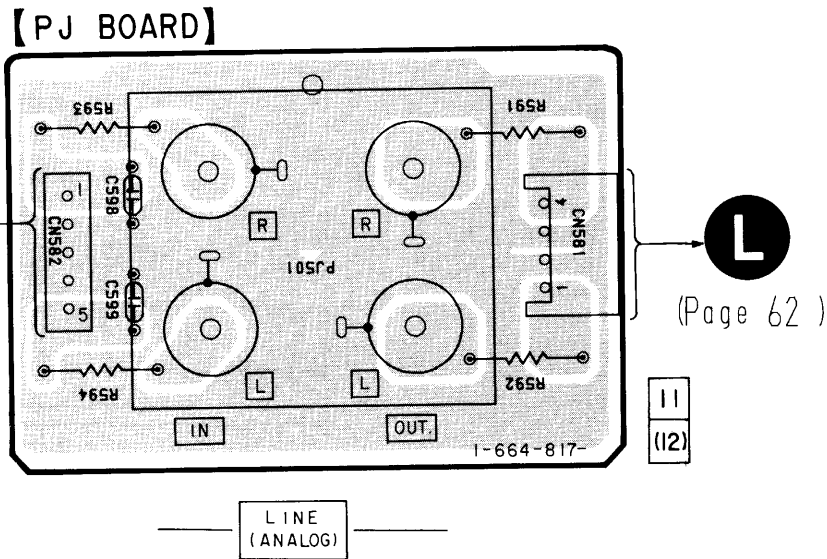
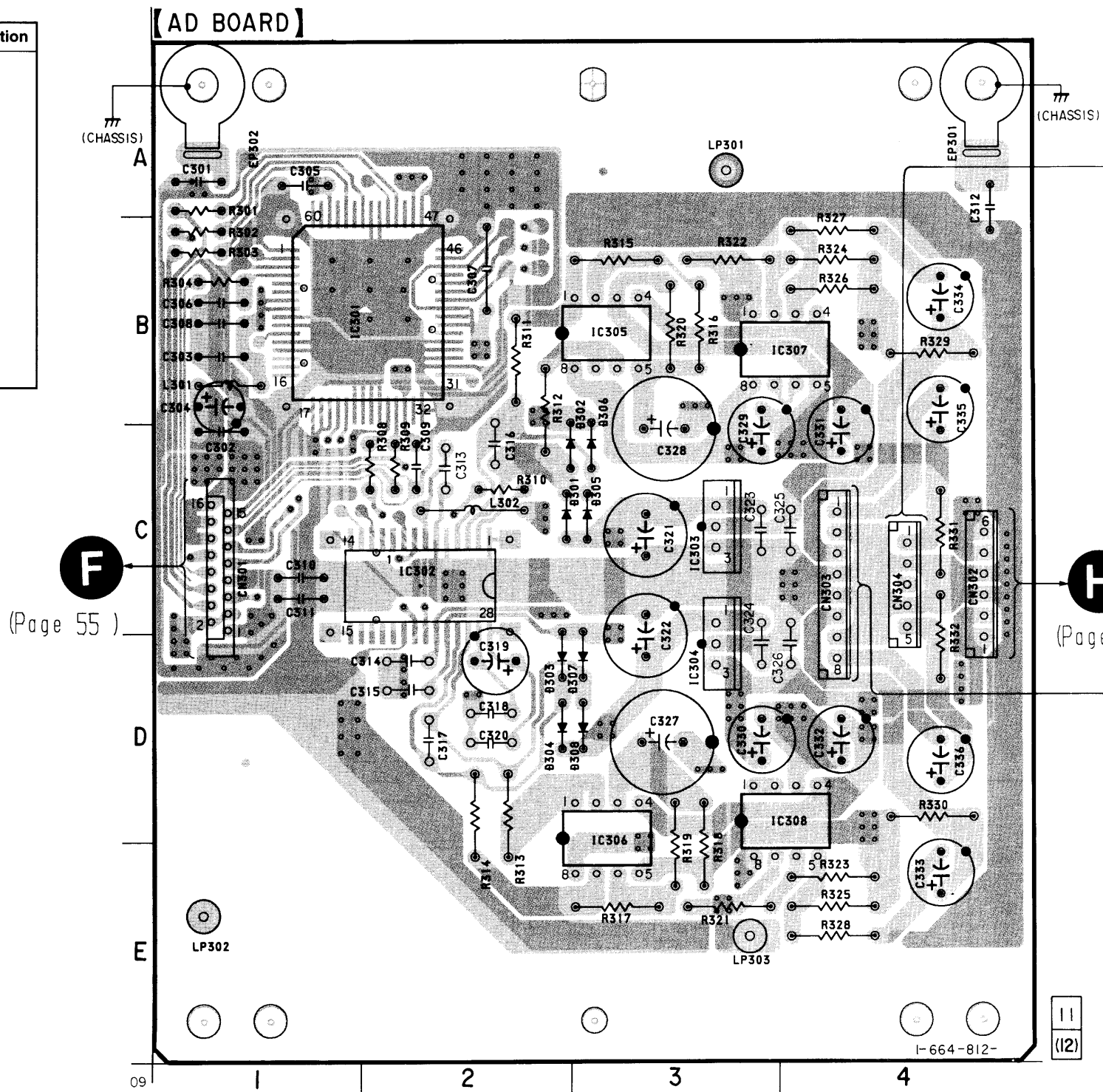
• Semiconductor Location

Ref. No.	Location
IC651	B-3
Q651	B-2
Q652	B-2
Q653	B-2
Q654	B-1



- **Semiconductor Location**

Ref. No.	Location
D301	C-3
D302	B-3
D303	D-2
D304	D-2
D305	C-3
D306	B-3
D307	D-3
D308	D-3
IC301	B-1
IC302	C-2
IC303	C-3
IC304	D-3
IC305	B-3
IC306	E-3
IC307	B-4
IC308	D-3

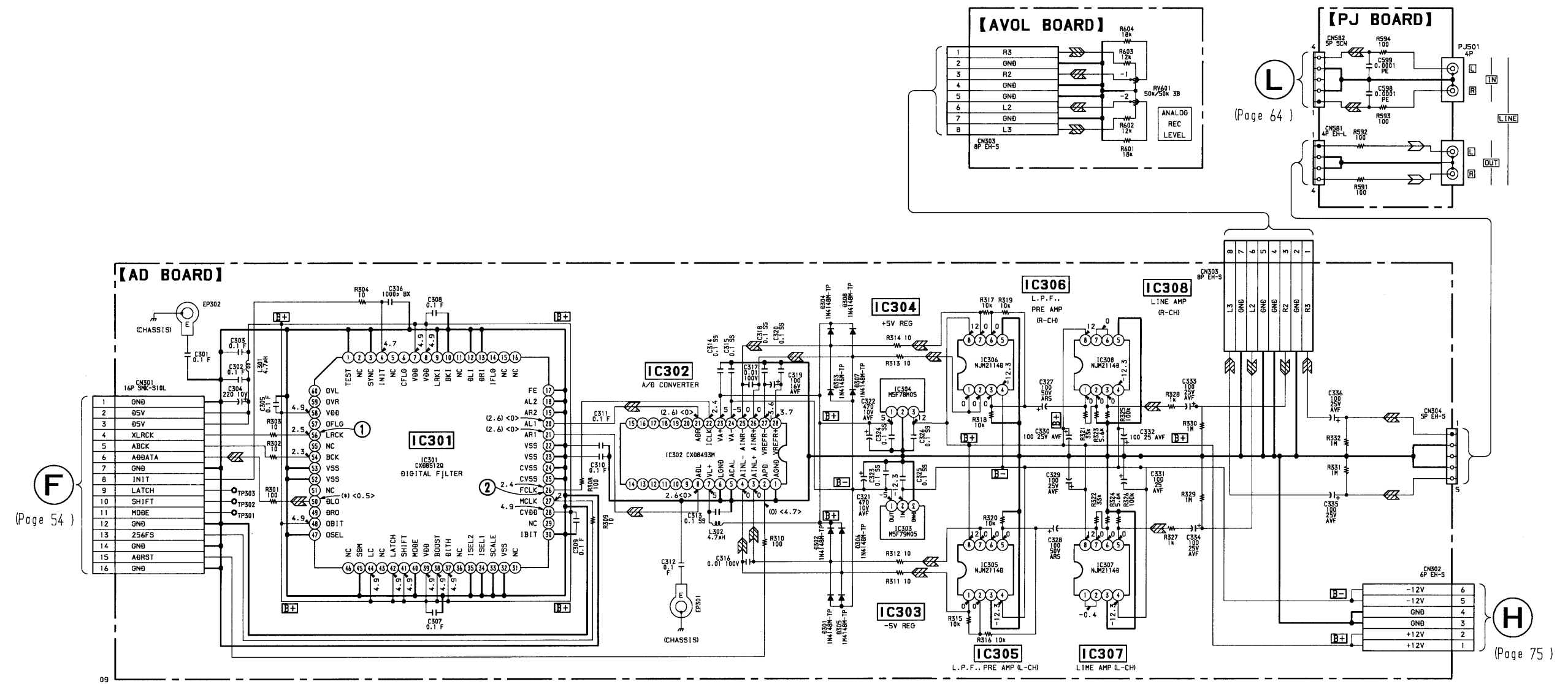


6-15. SCHEMATIC DIAGRAM — AD SECTION —

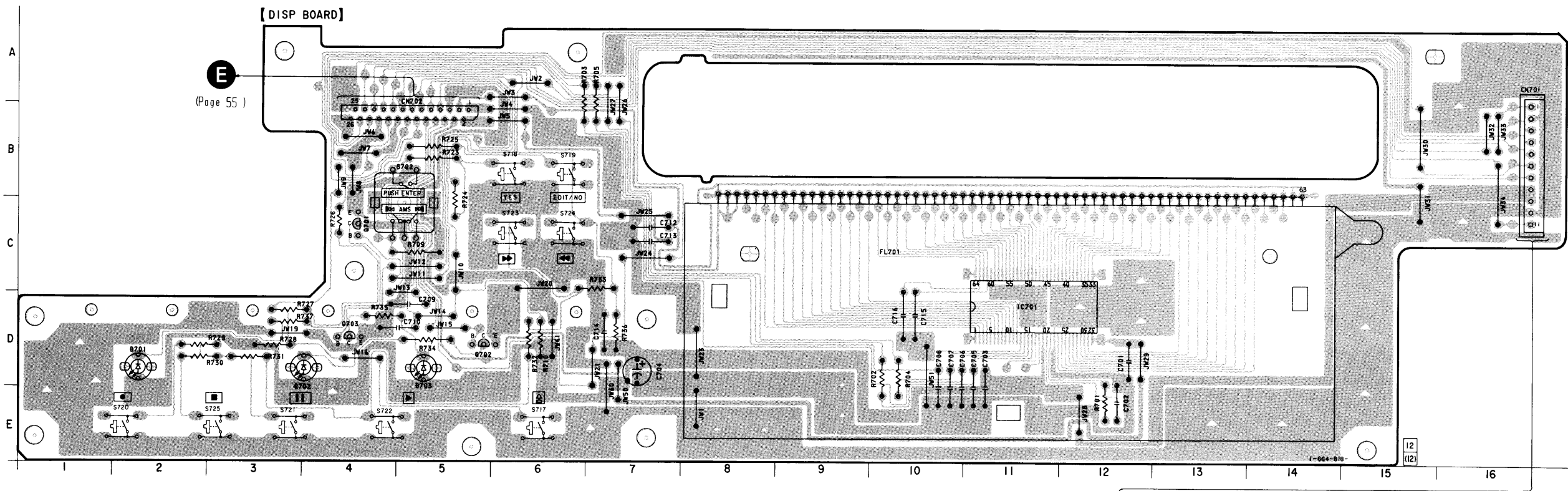
- See page 46 for Waveforms.
- See page 80 for IC Block Diagrams.
- See page 96 for IC Pin Functions.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

A
B
C
D
E
F
G
H
I
J



6-16. PRINTED WIRING BOARD — PANEL SECTION —
• See page 44 for Circuit Boards Location.

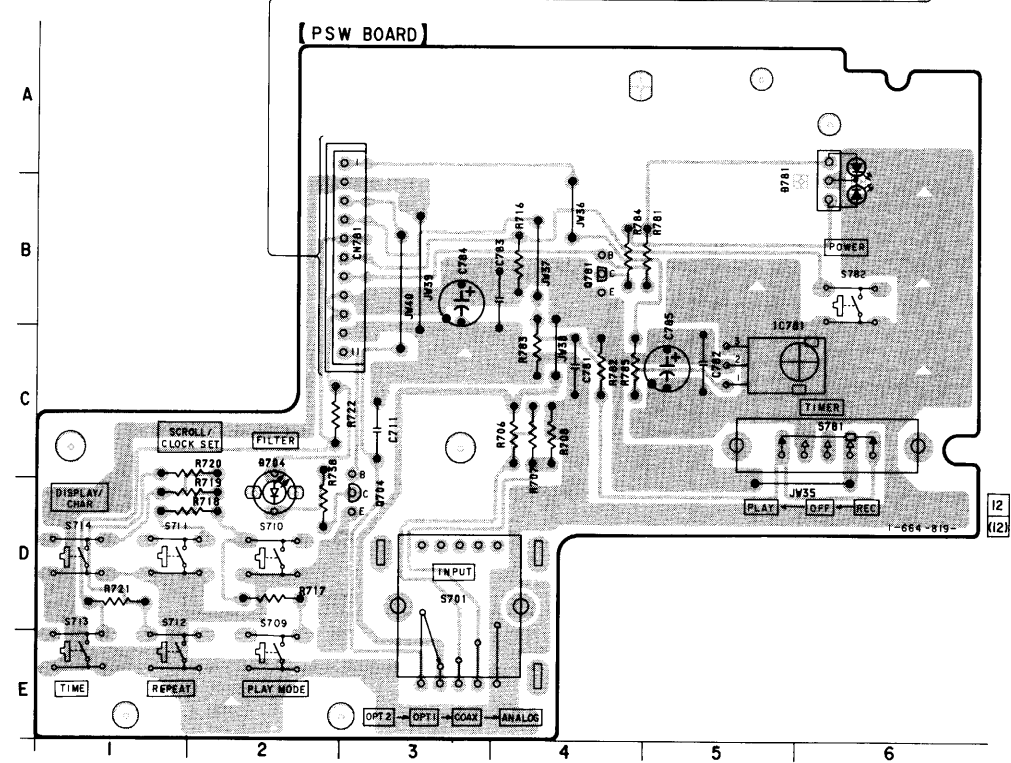


— DISP Board —
• Semiconductor Location

Ref. No.	Location
D701	D-2
D702	E-3
D703	E-5
IC701	D-11
Q701	C-4
Q702	D-5
Q703	D-4

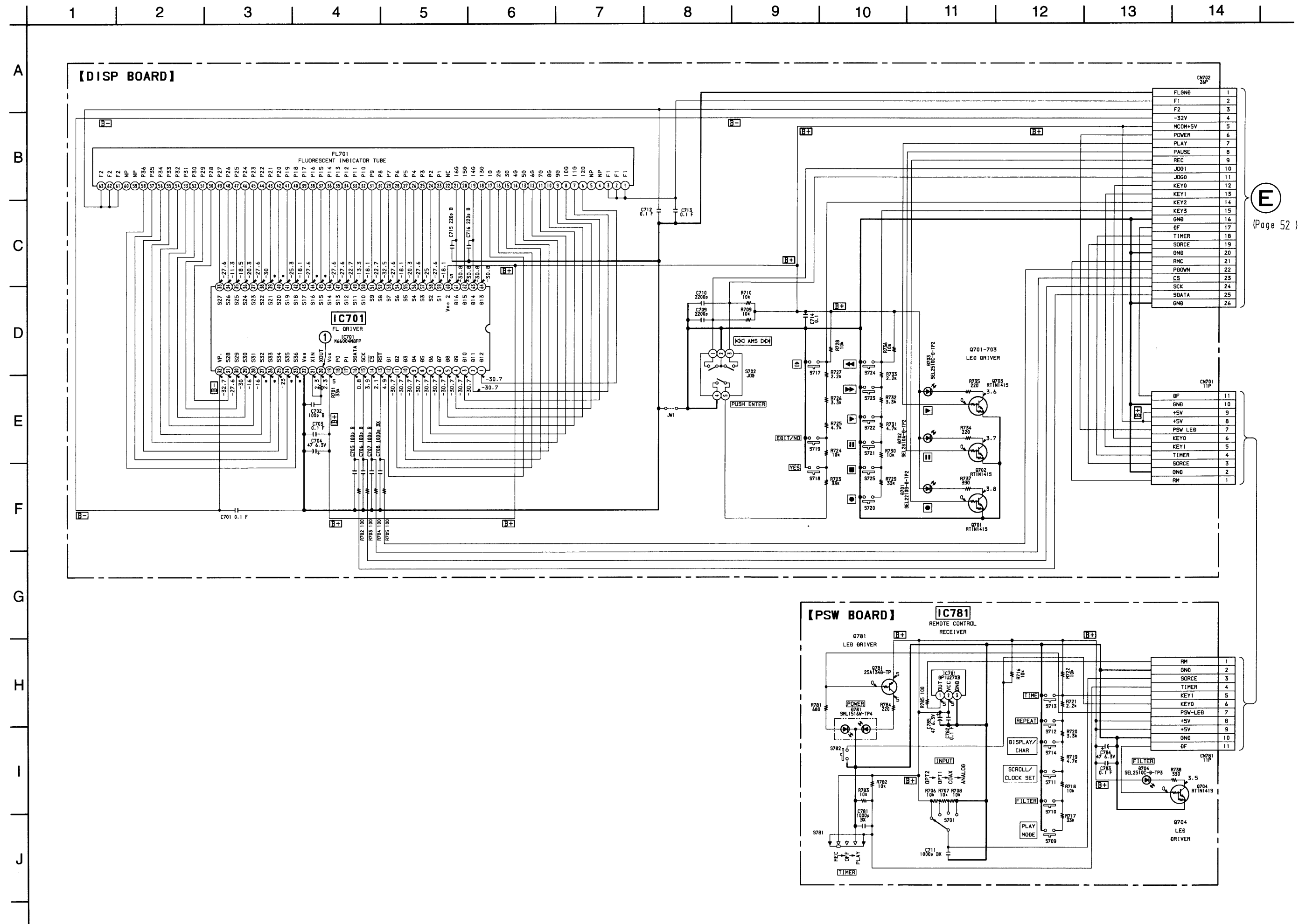
— PSW Board —
• Semiconductor Location

Ref. No.	Location
D704	D-2
D781	A-6
IC781	B-5
Q704	D-3
Q781	B-4



6-17. SCHEMATIC DIAGRAM — PANEL SECTION —

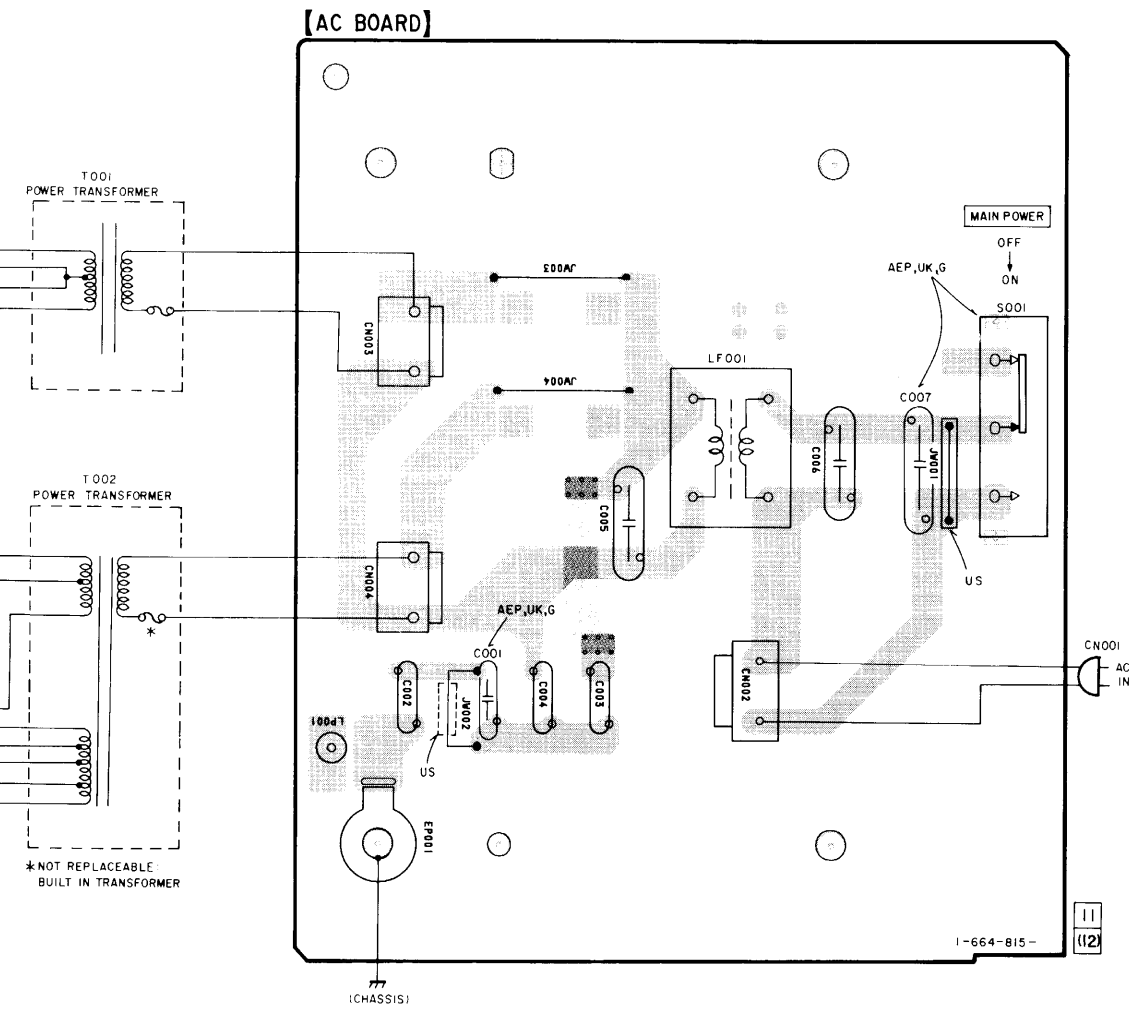
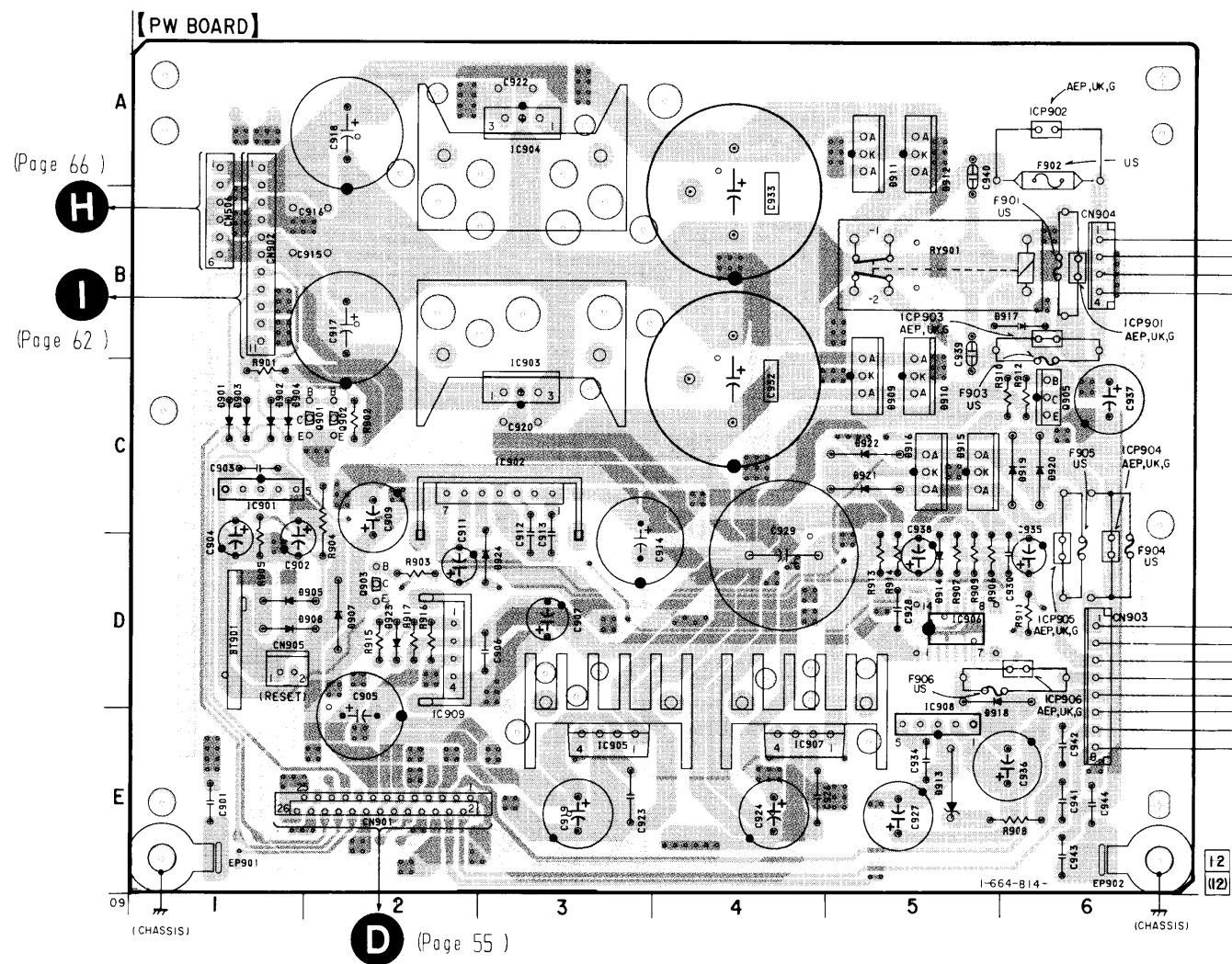
- See page 46 for Waveforms.
- See page 82 for IC Block Diagrams.



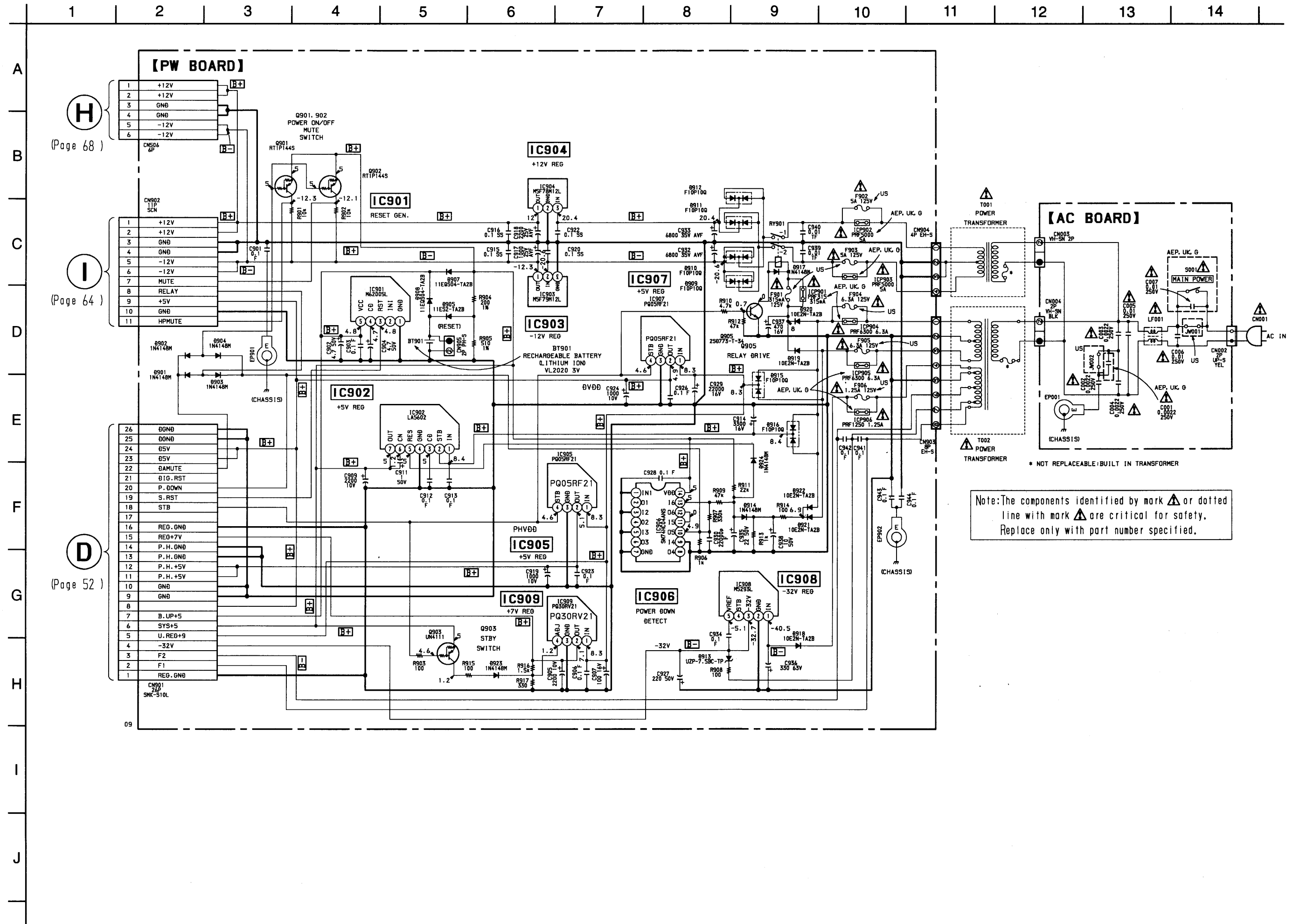
6-18. PRINTED WIRING BOARD — POWER SECTION —
• See page 44 for Circuit Boards Location.

• Semiconductor Location

Ref. No.	Location
D901	C-1
D902	C-1
D903	C-1
D904	C-1
D905	D-1
D907	D-2
D908	D-1
D909	C-5
D910	C-5
D911	B-5
D912	B-5
D913	E-5
D914	D-5
D915	C-5
D916	C-5
D917	B-6
D918	D-5
D919	C-6
D920	C-6
D921	C-5
D922	C-5
D923	D-2
D924	D-3
IC901	C-1
IC902	C-3
IC903	C-3
IC904	A-3
IC905	E-3
IC906	D-5
IC907	E-4
IC908	D-5
IC909	E-2
Q901	C-2
Q902	C-2
Q903	D-2
Q905	C-6

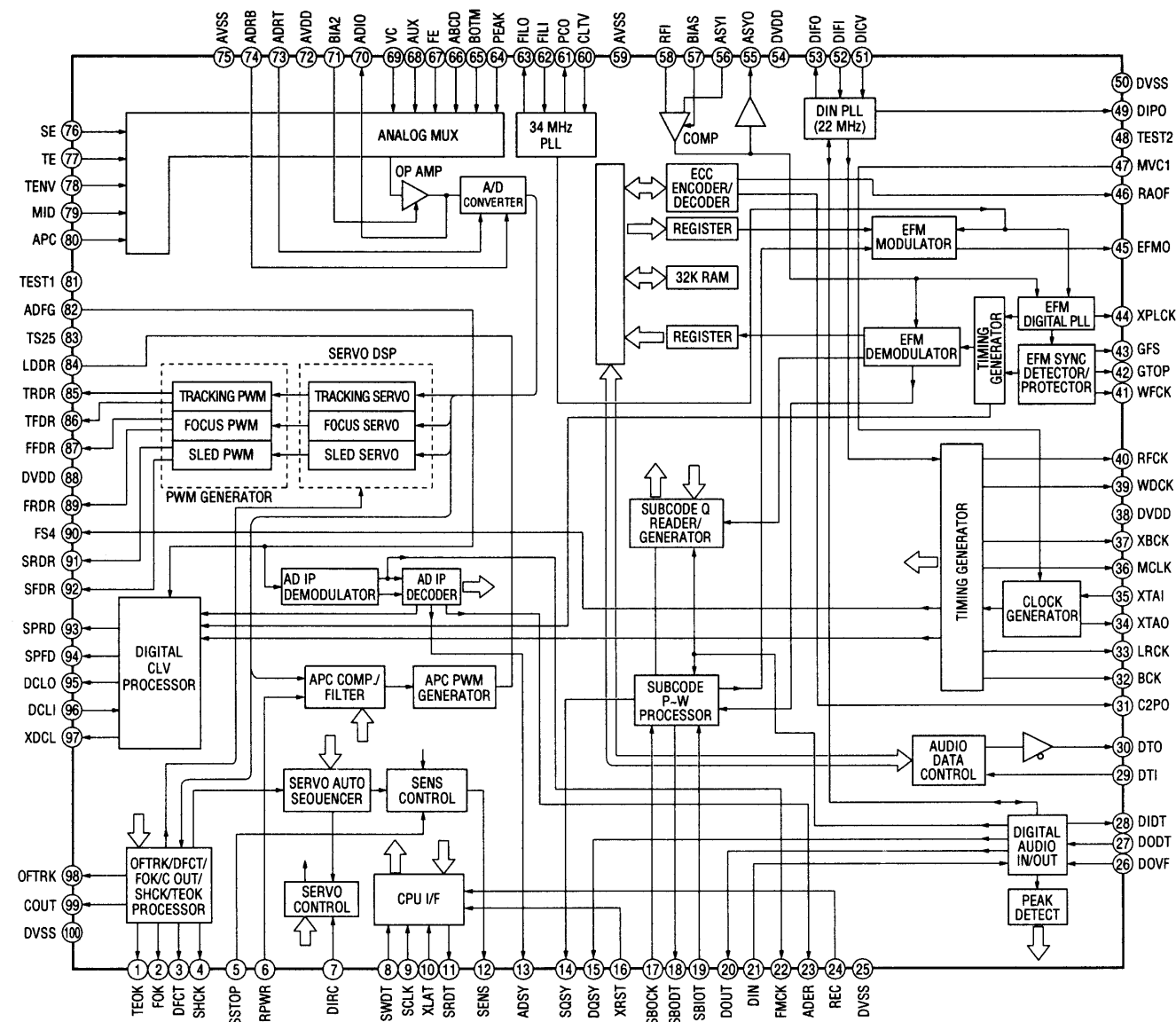


6-19. SCHEMATIC DIAGRAM — POWER SECTION —
• See page 83 for IC Block Diagrams.

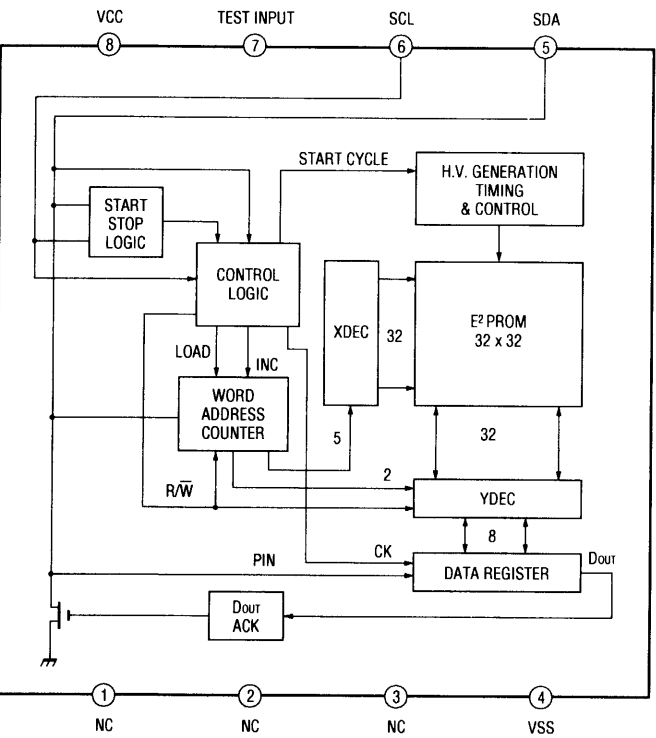


6-20. IC BLOCK DIAGRAMS

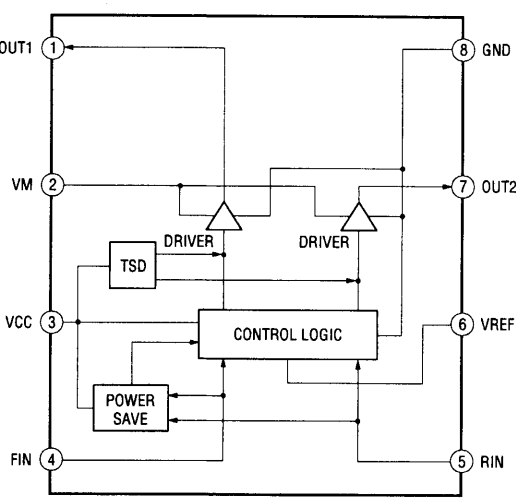
IC121 CXD2535CR



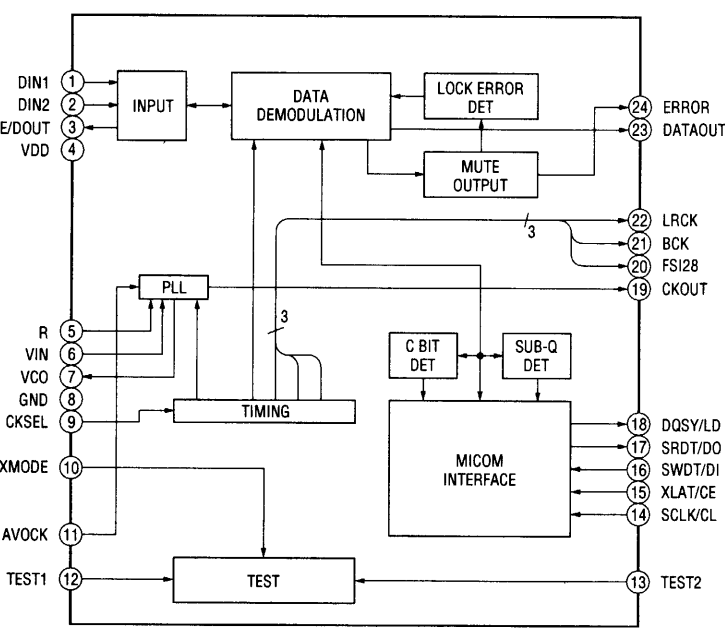
IC171 X24C01S



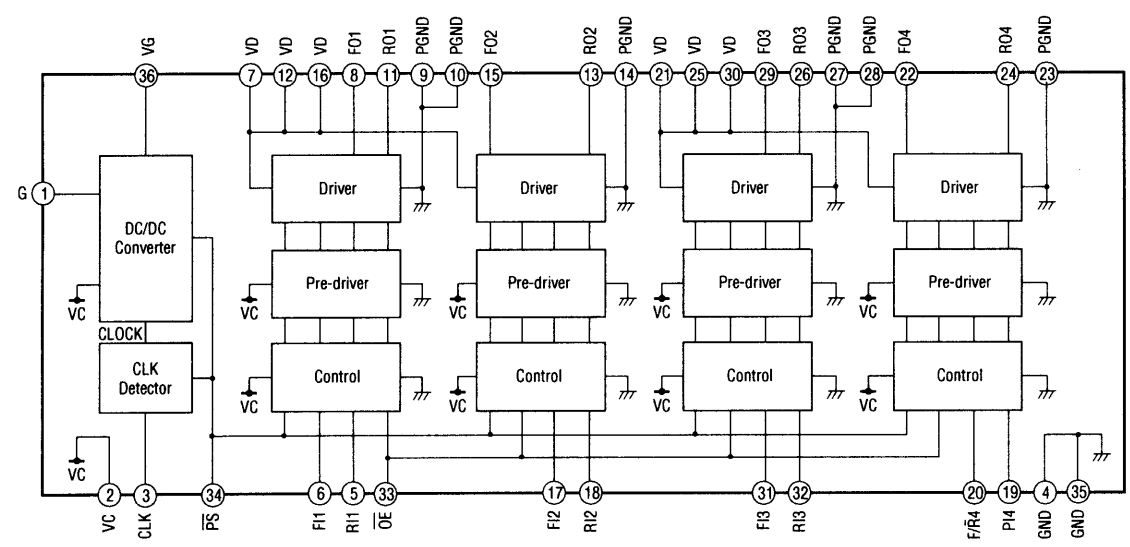
IC201, 212 BA6287F



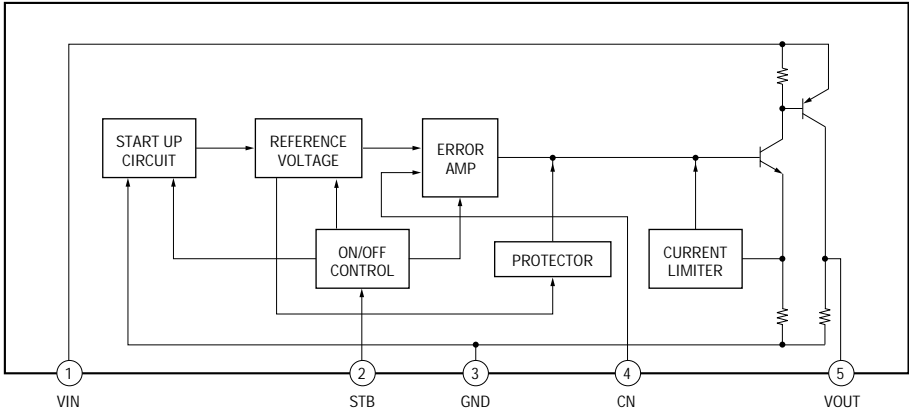
IC203 LC89051V-TLM



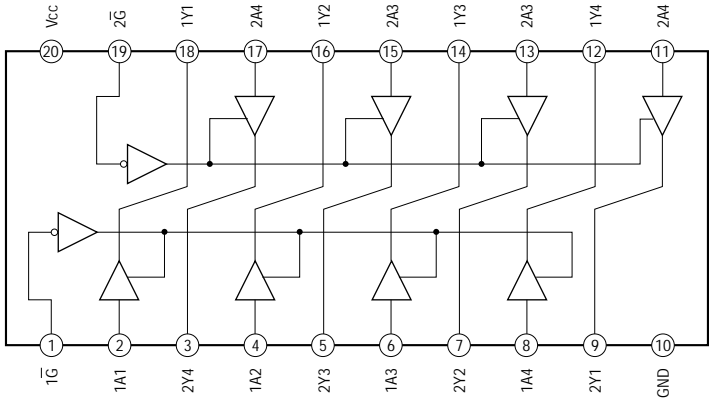
IC151 MPC17A38VMEL



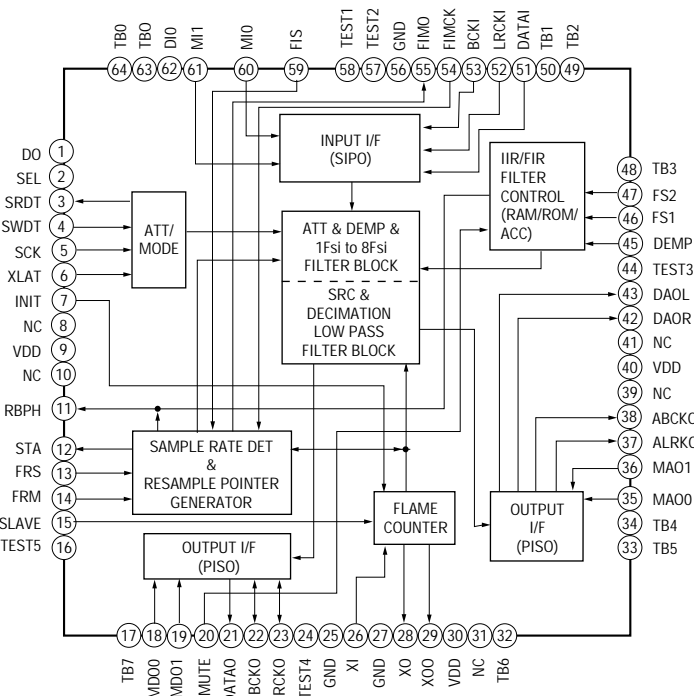
IC204 L88MS33T-TL



IC205 TC74LCX244FS (EL)
IC210 TC74VHCT244F (EL)

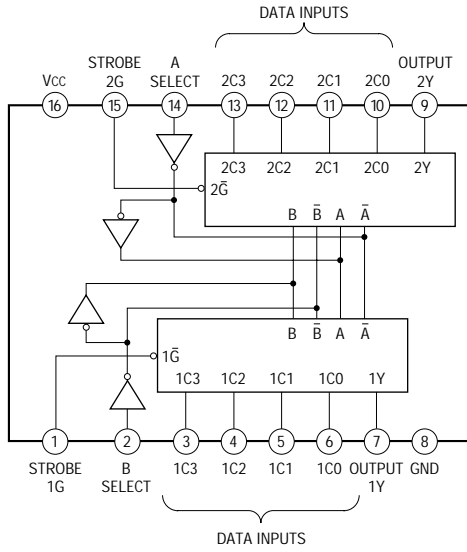


IC207 MSM9404AGS-BK

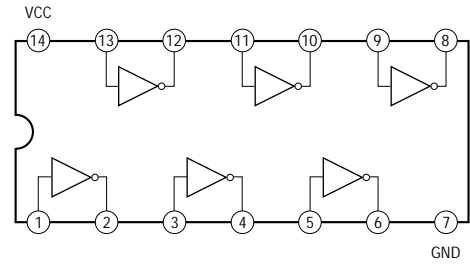


The diagram illustrates the pin configuration and internal architecture of the AT32F405 microcontroller. The pins are numbered 1 to 100, with Vss at pins 13, 25, 51, and 75. The internal architecture includes a CPU Command I/F, ATRAC Encoder/Decoder, Memory Controller I/F, Data Memory, ATRAC Encoder/Decoder I/F, RAM R/W Controller, CD-ROM Encoder/Decoder, EFM Encoder/Decoder I/F, and a Clock Generator. The diagram also shows the ATRAC Block, AI Block, and DI Block, along with the Address Generator and Audio I/F.

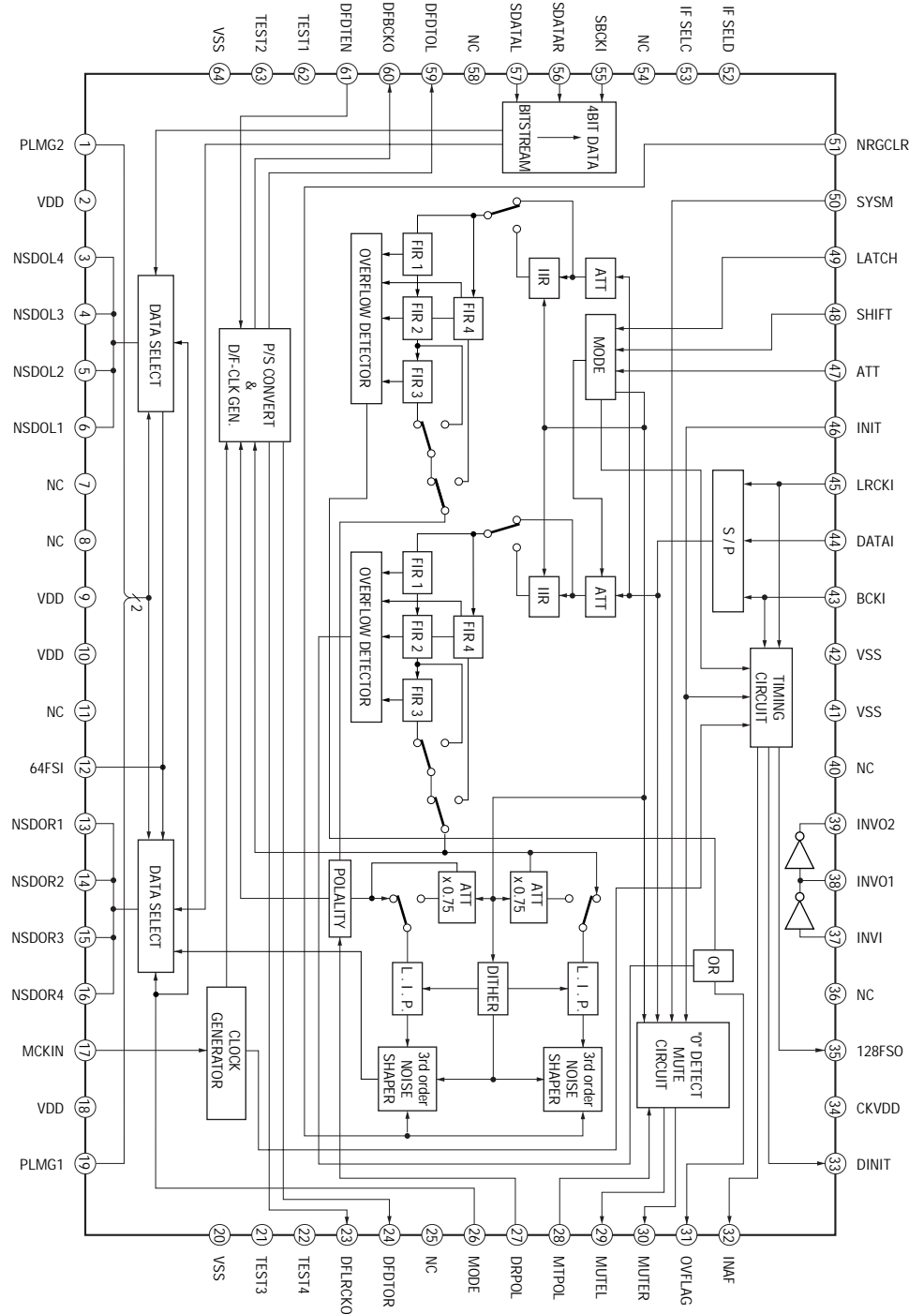
IC352 SN74HC153ANS-E20



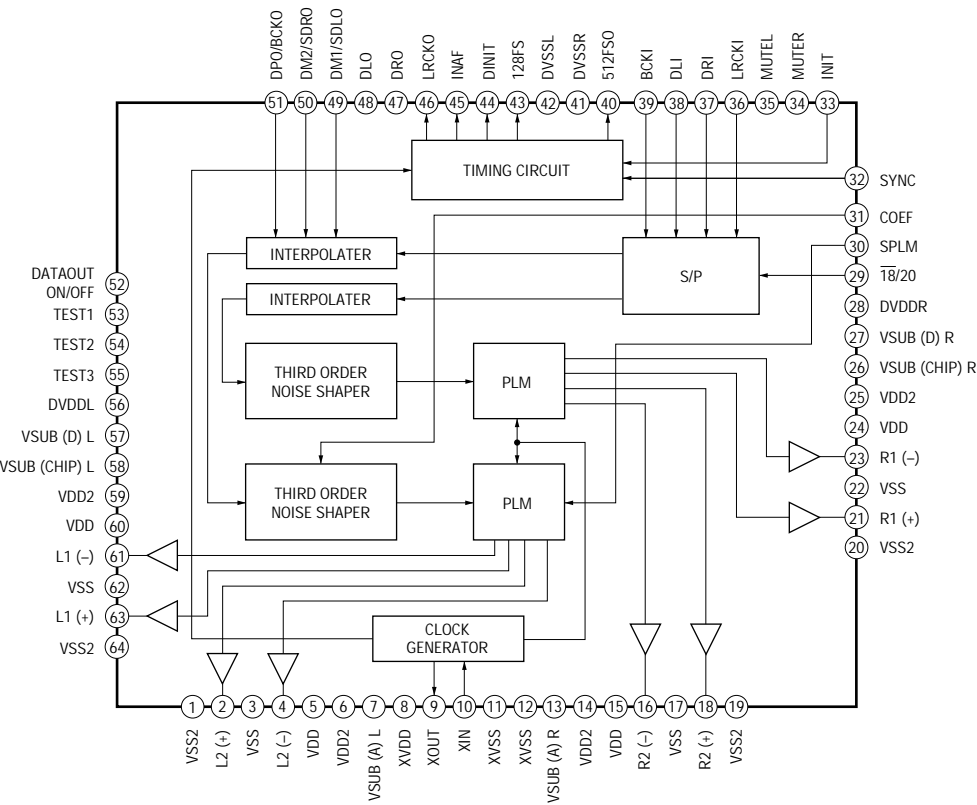
IC353 SN74HCU04ANS-E20



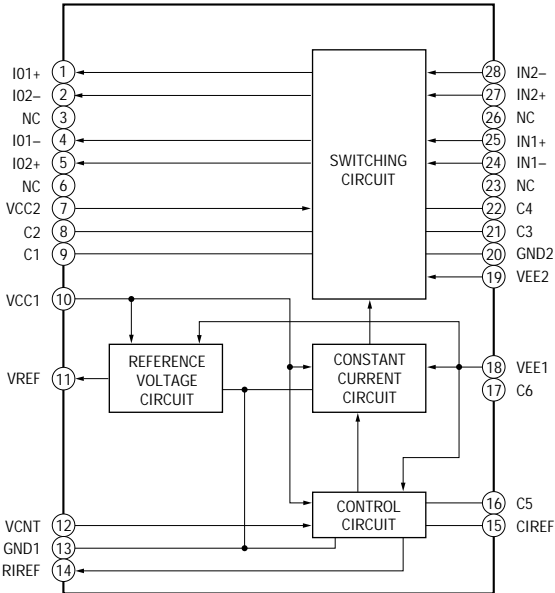
IC501 CXD8595Q



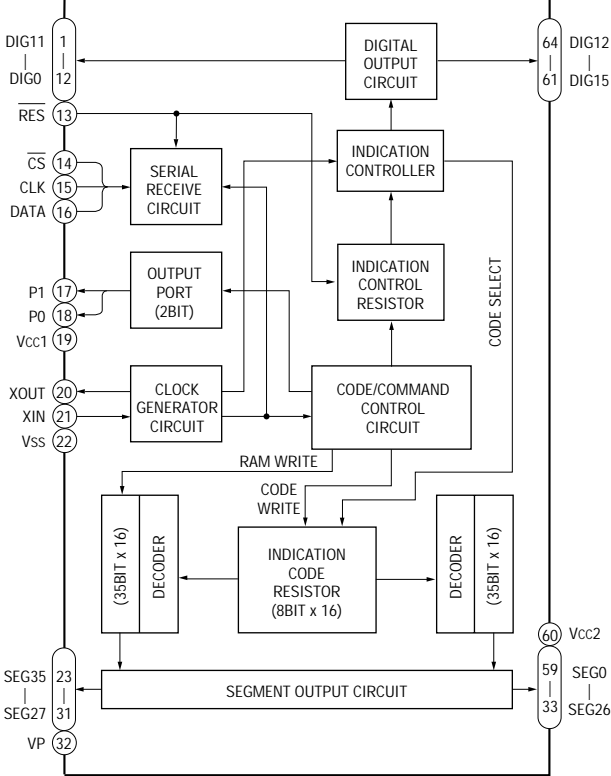
IC502 CXD2562Q-CS



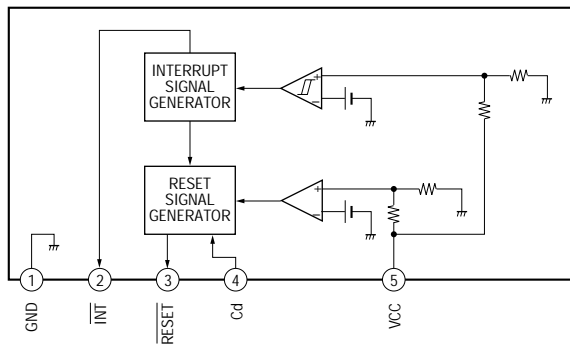
IC504, 505 CXA8042AS



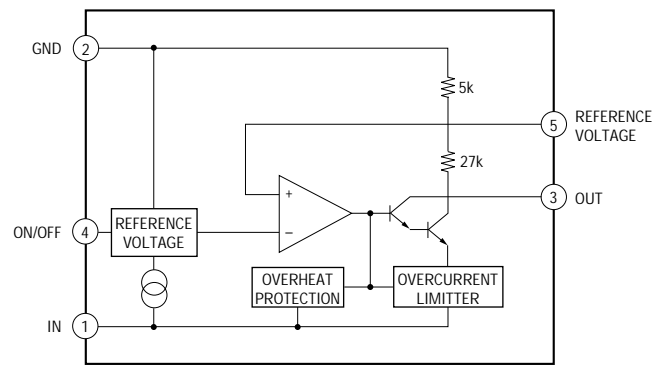
IC701 M66004M8FP



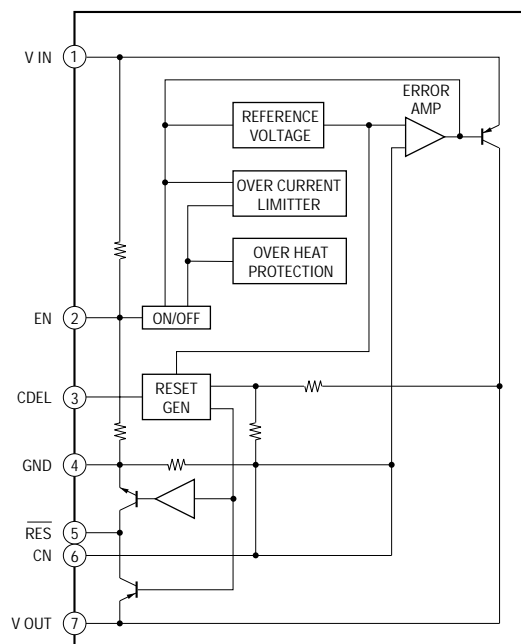
IC901 M62005L



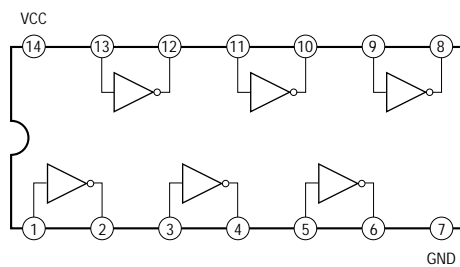
IC908 M5293L



IC902 LA5602



IC906 SN74HC04ANS-E20



6-21. IC PIN FUNCTIONS

• IC101 RF Amplifier (CXA1981AR)/BD board

Pin No.	Pin Name	I/O	Function
1	VC	O	Middle point voltage (+2.5V) generation output
2 to 7	A to F	I	Input of signal from optical pick-up detector
8	FI	I	F operation amplifier input
9	FO	O	F operation amplifier output
10	PD	I	Front monitor Connected to photo diode
11	APCREF	I	Input for setting laser power
12	TEMPI	I	Temperature sensor connection pin
13	GND	—	Ground
14	AAPC	O	APC LD amplifier output
15	DAPC	O	Digital APC output (Not used)
16	TEMPR	O	Temperature sensor reference voltage output
17	XRST	I	Input of reset signal from system controller Reset: “L”
18	SWDT	I	Input of write data signal from system controller
19	SCLK	I	Input of clock signal from system controller
20	XLAT	I	Input of latch signal from system controller
21	VREF	O	Reference voltage output (Not used)
22	TENV	O	Tracking envelop signal output (Not used)
23	THLD	I	Track hold capacitor connection pin
24	VCC	—	Power supply (+5V)
25	TFIL	I	Track hold input (Connected to VC)
26	TE	O	Output of tracking error signal to CXD2535CR
27	TLB	I	Input of add signal to tracking error
28	CSLED	I	Sled error LPF pin
29	SE	O	Output of sled error signal to CXD2535CR
30	ADFM	O	ADIP FM signal output
31	ADIN	I	Inputs ADIP FM signal by AC coupling
32	ADAGC	I	Connection pin of external capacitor for ADIP AGC
33	ADFG	O	Output of ADIP dual FM signal to CXD2535CR (22.05 kHz±1 kHz)
34	AUX	O	Output of auxiliary signal to CXD2535CR
35	FE	O	Output of focus error signal to CXD2535CR
36	FLB	I	Focus bias control input (Not used)
37	ABCD	O	Output of light amount signal to CXD2535CR
38	BOTM	O	Output of bottom hold signal of light amount signal to CXD2535CR
39	PEAK	O	Output of peak hold signal of light amount signal to CXD2535CR
40	RFAGC	I	Connection pin of RF AGC circuit external capacitor
41	RF	O	Output of playback EFM RF signal to CXD2535CR
42	ISSET	I	Internal circuit constant setting pin 22 kHz BPF center frequency (Fixed at “H”)
43	AGCT	I	Inputs RF signal by AC coupling
44	RFO	O	Output pin of RF signal
45	MORFI	I	Inputs MO RF signal by AC coupling
46	MORFO	O	Output pin of MO RF signal
47, 48	I, J	I	Input of signal from optical pick-up detector

• IC121 Digital Signal Processor, Digital Servo Processor, EFM/ACIRC Encoder/Decoder (CXD2535CR)/BD board

Pin No.	Pin Name	I/O	Function
1	FS256	O	11.2896 MHz clock output (MCLK) (Not used)
2	FOK	O	Output of FOK signal to system controller Outputs “H” when focus is set
3	DFCT	O	Outputs defect ON/OFF switching signal to ATRAC encoder/decoder
4	SHCK	O	Outputs track jump detection signal to system controller
5	SHCKEN	I	Track jump detection enable input (Not used) (Fixed at “H”)
6	WRPWR	I	Inputs laser power switching signal from system controller
7	DIRC	I	Disc drive recording/playback switching signal input (Fixed at “H”)
8	SWDT	I	Inputs write data signal from system controller
9	SCLK	I	Inputs serial clock signal from system controller
10	XLAT	I	Inputs serial latch signal from system controller
11	SRDT	O	Outputs read data signal to system controller
12	SENS	O (3)	Outputs internal status (SENSE) to system controller
13	ADSY	O	ADIP sync signal output (Not used)
14	SQSY	O	Output subcode Q sync (SCOR) to system controller Outputs “L” every 13.3 msec Outputs “H” at all most mostly
15	DQSY	O	Outputs digital-in U-bit CD format subcode Q sync (SCOR) to system controller Outputs “L” every 13.3 msec Outputs “H” at all most mostly
16	XRST	I	Inputs reset signal from system controller Reset: “L”
17	TEST4	I	Test input (Fixed at “L”)
18	CLVSCK	O	Not used
19	TEST5	I	Test input (Fixed at “L”)
20	DOUT	O	Digital audio signal output (For optical output)
21	DIN	I	Digital audio signal input (For optical input) (Not used)
22	FMCK	O	ADIP FM demodulation clock signal output
23	ADER	O	ADIP CRC flag output “H”:Error
24	REC	I	Input of recording/playback switching signal from system controller Recording: “H” Playback: “L”
25	DVSS	—	Ground (Digital)
26	DOVF	I	Digital audio output validity flag input (Fixed at “L”)
27	DODT	I	Input of 16bit data for digital audio output
28	DIDT	O	Output of 16bit data for digital audio input to ATRAC encoder/decoder
29	DTI	I	Input of recording audio data signal from ATRAC encoder/decoder
30	DTO	O (3)	Output of playback audio data signal to ATRAC encoder/decoder
31	C2PO	O	Outputs C2PO signal to ATRAC encoder/decoder (Output indicating data error status) Playback: C2PO (“H”) Digital recording: Digital-in-Vflag Analog recording: “L”
32	BCK	O	Outputs bit clock signal (2.8224 MHz) (MCLK)
33	LRCK	O	Outputs L/R clock signal (44.1 kHz) (MCLK)
34	XTAO	O	System clock (512 fs=22.5792 MHz) signal output
35	XTAI	I	Input of system clock (512fs=22.5792 MHz) signal input
36	MCLK	O	MCLK clock (22.5792 MHz) signal output (Not used)
37	XBCK	O	Pin 32 (BCK) inversion output (Not used)
38	DVDD	—	Power supply (+5V) (Digital)
39	WDCK	O	WDCK clock (88.2 kHz) signal output (MCLK)
40	RFCK	O	RFCK clock (7.35 kHz) signal output (MCLK)

Pin No.	Pin Name	I/O	Function
41	WFCK	O	WFCK clock (7.35 kHz) signal output (Playback: EFM decoder PLL Recording: EFM encoder PLL)
42	GTOP	O	“H”: Opens playback EFM frame sync protection window
43	GFS	O	“H”: Playback EFM sync and interpolation protection timing match
44	XPLCK	O	EFM decoder PLL clock output (98 fs=4.3218 MHz) Falling edge and EFM signal edge match
45	EFMO	O	EFM signal output (Recording)
46	RAOF	O	Internal RAM overflow detection signal output (decoder monitor output) Outputs “H” when the disc rotation exceeds $\pm 4F$ jitter margin during playback
47	MVCI	I	Digital-in PLL oscillation input (Not used) (Fixed at “L”)
48	TEST2	I	Test pin (Fixed at “L”)
49	DIPD	O (3)	Digital-in PLL phase comparison output Internal VCO: (Frequency: Low \rightarrow “H”) External VCO: (Frequency: Low \rightarrow “L”)
50	DVSS	—	Ground (Digital)
51	DICV	I (A)	Digital-in PLL internal VCO control voltage input
52	DIFI	I (A)	Filter input when digital-in PLL internal VCO is used
53	DIFO	O (A)	Filter output when digital-in PLL internal VCO is used (Not used)
54	AVDD	—	Power supply (+5V) (Analog)
55	ASYO	O	Playback EFM full-swing output (L=VSS, H=VDD)
56	ASYI	I (A)	Playback EFM asymmetry comparate voltage input
57	BIAS	I (A)	Playback EFM asymmetry circuit constant current input
58	RFI	I (A)	Inputs playback EFM RF signal from RF amplifier
59	AVSS	—	Ground (Analog)
60	CLTV	I (A)	Decoder PLL master clock PLL VCO control voltage input
61	PCO	O (3)	Decoder PLL master clock PLL phase comparison output
62	FILI	I (A)	Decoder PLL master clock PLL filter input
63	FILO	O (3)	Decoder PLL master clock PLL filter output
64	PEAK	I (A)	Inputs peak hold signal for light amount signal from RF amplifier
65	BOTM	I (A)	Inputs bottom hold signal for light amount signal from RF amplifier
66	ABCD	I (A)	Light amount signal from RF amplifier
67	FE	I (A)	Input of focus error signal from RF amplifier
68	AUX1	I (A)	Input of auxiliary signal from RF amplifier
69	VC	I (A)	Input of middle point voltage (+2.5V) from RF amplifier
70	ADIO	O (A)	A/D converter input signal monitor output
71	TEST3	I (A)	Test input (Fixed at “L”)
72	AVDD	—	Power supply (+5V) (Analog)
73	ADRT	I (A)	A/D converter operation range upper limit voltage input (Fixed at “H”)
74	ADRB	I (A)	A/D converter operation range lower limit voltage input (Fixed at “L”)
75	AVSS	—	Ground (Analog)
76	SE	I (A)	Input of sled error signal from RF amplifier
77	TE	I (A)	Input of tracking error signal from RF amplifier
78	AUX2	I (A)	Auxiliary input pin 2 (Fixed at “L”)
79	DCHG	I (A)	Connected to ground
80	APC	I (A)	Laser APC input (Fixed at “L”)

• Abbreviation

EFM : Eight to Fourteen Modulation

PLL : Phase Locked Loop

Pin No.	Pin Name	I/O	Function
81	TEST1	I	Test pin (Fixed at “L”)
82	ADFG	I	Input of ADIP dual FM signal from RF amplifier (22.05 kHz \pm 1 kHz) (TTL Schmidt input)
83	TS25	I	Test pin (Fixed at “L”)
84	LDDR	O	Laser APC signal output
85	TRDR	O	Tracking servo drive signal output (–)
86	TFDR	O	Tracking servo drive signal output (+)
87	FFDR	O	Focus servo drive signal output (+)
88	DVDD	—	Power supply (+5V) (Digital)
89	FRDR	O	Focus servo drive signal output (–)
90	FS4	O	176.4 kHz clock signal output (MCLK) (Not used)
91	SRDR	O	Sled servo drive signal output (–)
92	SFDR	O	Sled servo drive signal output (+)
93	SPRD	O	Spindle servo drive signal output (–)
94	SPFD	O	Spindle servo drive signal output (+)
95	DCLO	O	Not used normally
96	DCLI	I	Not used normally (Fixed at “H”)
97	XDCL	O	Not used normally
98	OFTRK	O	Off track signal output (Not used)
99	COUT	O	Traverse count signal output (Not used)
100	DVSS	—	Ground (Digital)

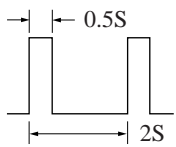
* (3) of I/O is 3-state output, (A) is analog output.

• IC202 System Controller (M30610EC-1086FP)/DIG board

Pin No.	Pin Name	I/O	Function
1, 2	—	—	Not used
3	JOG0	I	AMS jog signal input
4	JOG1	I	
5	SQSY	I	ATP address sync or sub code Q sync (SCOR) input from CXD2535CR “L” is input every 13.3 msec Mainly “H”
6	REMOCON	I	Remote control signal interruption input
7	—	—	Not used
8	BYTE	I	Data bus switching signal input “L”:Single chip mode (Fixed at “L”)
9	CNVSS	—	Ground
10	XIN-T	I	Sub clock input (37.768 kHz)
11	XOUT-T	O	Sub clock output (32.768 kHz)
12	SYSTEM-RST	I	System reset input “L”:Reset
13	XOUT	O	Main clock output (10 MHz)
14	GND	—	Ground
15	XIN	I	Main clock input (10 MHz)
16	+5V	—	Power supply (+5V)
17	MNI	I	Not used
18	—	—	
19	POWER DOWN	I	Power down detection signal input “L”:Power down
20	DQSY	I	Digital-in U-bit CD format sub code Q sync (SCOR) input from CXD2535CR “L” is input every 13.3 msec Mainly “H”
21, 22	—	—	Not used
23	XINT	I	Interruption status input from ATRAC encoder/decoder
24	04LAT	O	Data read signal output to sampling rate converter, digital filter “L”:Active
25	62RST	O	Reset signal output to D/A converter “L”:Reset
26	95RST	O	Reset signal output to CXD8595Q “L”:Reset
27	95LAT	O	Transmission data latch signal output to CXD8595Q
28	ADRST	O	Reset signal output to A/D converter “H”:Reset
29	ADLAT	O	Latch signal output to A/D converter
30	XLATCH	O	Serial data latch signal output
31	SWDT	O	Write data signal input to serial bus
32	SRDT	I	Read data signal input from serial bus
33	SCLK	O	Clock signal output to serial bus
34	—	—	Not used
35	FLDATA	O	Transmission data clock output to FL driver
36	—	—	Not used
37	FLCLK	O	Transmission data clock output to FL driver
38	FLCS	O	Transmission data chip select output to FL driver
39	—	—	Not used
40	COAX/XOPT	O	Digital-in select signal output “L”:Optical input, “H”:Coaxial input
41	OPT1/XOPT2	O	Digital-in select signal output “L”:OPT2, “H”:OPT1
42	DIN/XMD	O	Digital-out select signal output “L”:MD, “H”:Digital in through
43	EROR	I	Digital-in error signal input
44	SRCRST	O	Reset signal output to sampling rate converter, digital filter “L”:Reset

• Abbreviation

FL : Fluorescent indicator tube

Pin No.	Pin Name	I/O	Function
45	SRC TEST	O	The second reset signal output from sampling rate converter
46 to 48	—	—	Not used
49	DAMUTE	O	D/A line mute output “L”:Active
50	STB	O	Strobe signal output to power supply circuit When power is ON:“H”, When standby:“L”
51	OUTSW	I	Detection input from loading out detection switch
52	INSW	I	Detection input from loading in detection switch
53	—	—	Not used
54	LDIN	O	Loading motor control output
55	LDOUT	O	
56	HUP	O	Magnetic head up/down control output
57	HDWN	O	
58	37RST	O	Reset signal output to ATRAC encoder/decoder “L”:Reset
59	HUPS	I	Detection input from magnetic head up detection switch
60	HADOWNS	I	Detection input from magnetic head down detection switch
61	REC/PB	O	Recording/playback selection signal output to CXD2535CR When recording:“H”, when playing back:“L”
62	VCC	—	Power supply (+5V)
63	—	—	Not used
64	VSS	—	Ground
65	—	—	Not used
66	MOD	O	Laser modulation switching signal output During playback power: “L”, During stop:“H” During recording power: 
67	SCTX	O	Write data transmission timing output to ATRAC encoder/decoder Used also as magnetic head ON/OFF output
68	FG	I	FG detection signal output from spindle motor driver
69	FOK	I	FOK signal input from CXD2535CR “H” is input when focus is set
70	SHCK	I	Track jump detection signal input from CXD2535CR
71	WRPWR	O	Laser power switching signal output to optical pick-up and CXD2535CR
72	DIG-RST	O	Digital reset signal output
73	—	—	Not used
74	SDA	I/O	Input/output of data signal with EEPROM
75	SCL	O	Clock signal output to EEPROM
76	SENS	I	Internal status (SENSE) input from CXD2535CR
77	PROTECT	I	Recording prevention tab detection input from protect detection switch When protect is ON:“H”
78	REFLECT	I	Disc reflection rate detection input from reflect detection switch When low reflection rate disc is used:“H”
79	LDON	O	Laser ON/OFF control output “H”:Laser ON
80	LIMIT-IN	I	Detection input from limit-in switch When sled limit in:“L”

Pin No.	Pin Name	I/O	Function
81	CSET0	I	Destination setting pin
82	CSET1	I	
83	POWER	O	POWER LED drive output
84	PLAY	O	PLAY (▶) LED drive output
85	—	—	Not used
86	REC	O	REC (●) LED drive output
87	—	—	Not used
88	PAUSE	O	PAUSE (⏸) LED drive output
89	—	—	Not used
90	KEY1	I	Key input (A/D)
91	KEY2	I	
92	KEY3	I	
93	KEY0	I	
94	TIMER	I	Timer recording/playback/OFF switching input “L”:Playback, “H”:Recording, “M”:OFF
95	SORCE	I	Input signal (analog/digital input) selection signal input
96	AVSS(AGND)	—	Analog ground
97	DVOL	I	Digital input level volume input (A/D)
98	VREF(+5V)	I	A/D reference voltage input (+5V)
99	AVCC	—	Analog power supply (+5V)
100	DF	O	FILTER LED drive output

• IC203 Digital Audio Interface Receiver (LC89051V-TLM)/DIG board

Pin No.	Pin Name	I/O	Function
1	DIN1	I	Data input with built-in amplifier (responding to the coaxial optical module)
2	DIN2	I	Data input (responding to the optical module) (Not used)
3	E/DOUT	O	Emphasis, input bi-phase, validity flag output (Not used)
4	VDD	—	Power supply (+5V)
5	R	I	VCO gain control input
6	VIN	I	VCO freerunning frequency setting input
7	VCO	O	LPF setting of PLL
8	GND	—	Ground
9	CKSEL	I	System clock select input (384fs, 512fs) (Fixed at “H”)
10	XMODE	I	Reset input
11	AVOCK	I	Clock input for preventing PLL lock failure
12	TST1	I	Test input (Normally “L”)
13	TST2	I	
14	SCLK	I	Microcomputer IF clock input
15	XLAT	I	Microcomputer IF latch/chip enable input
16	SWDT	I	Microcomputer IF write data input
17	SRDT	O	Microcomputer IF read data output
18	DQSY	O	Microcomputer IF Sub-Q sync and ID sync output
19	CKOUT	O	VCO clock output (freerunning, 384fs, 512fs)
20	FS128	O	128fs clock output (Not used)
21	BCK	O	Bit clock output
22	LRCK	O	L/R clock output
23	DATAOUT	O	Audio data output
24	ERROR	O	PLL lock error mute output

• IC206 Shock-Proof Memory Controller, ATRAC Encoder/Decoder (CXD2537R)/DIG board

Pin No.	Pin Name	I/O	Function
1	VDD	—	Power supply (+5V)
2	SWDT	I	Input of write data signal from system controller
3	SCK	I	Input of serial clock signal from system controller
4	XLAT	I	Input of serial latch signal from system controller
5	SRDT	O/Z	Output of read data signal to system controller
6	SENSE	O/Z	Internal status (SENSE) output (Not used)
7	SCMD0	I	Serial command control mode input (Fixed at “H”)
8	SCMD1	I	
9	XINT	O	Interrupt status output
10	RCPB	I	Recording/playback switching input “L”: Recording mode (Fixed at “L”)
11	WRMN	I	Write/monitor mode switching signal input “H”: Monitor mode (Fixed at “L”)
12	TX	I	Write data transmission timing input Also used as magnetic field head ON/OFF output
13	VSS	—	Ground
14	SICK	I	Chip reservation pin (Fixed at “L”)
15	IDSL	I	
16	XILT	I	Chip reservation pin (Fixed at “H”)
17	XRST	I	Input of reset signal from system controller Reset: “L”
18 to 21	TS0 to TS3	I	Test pin (Fixed at “L”)
22	EXIR	I	Chip reservation pin (Fixed at “L”)
23	SASL	I	Block selection in single use “L”: ATRAC “H”: RAM controller (Fixed at “L”)
24	SNGLE	I	Normally fixed at “L” Fixed at “H” when used as ATRAC or RAM controller for single (Fixed at “L”)
25	VSS	—	Ground
26	AIRCPB	O	Output of ATRAC and external audio block recording/playback mode signal (Not used)
27	XRQ	O	ATRAC I/F data request signal output (Not used)
28	ADTO	I	ATRAC decode data signal input (Not used)
29	ADTI	O	ATRAC encode data signal output (Not used)
30	XALT	I	ATRAC I/F XALT signal input (Not used)
31	ACK	I	ATRAC I/F ACK signal input (Not used)
32	AC2	I	ATRAC I/F C2PO signal input (Not used)
33	LCHST	I/O	ATRAC I/F Lch start data signal input/output (Not used)
34	EXE	I/O	ATRAC I/F EXE signal input/output (Not used)
35	MUTE	I/O	ATRAC I/F MUTE signal input/output (Not used)
36	OSCO	O	Clock output (45 MHz) (Not used)
37	OSCI	I	Clock input (45 MHz)
38	VSS	—	Ground
39	ATT	I/O	ATRAC I/F ATT signal input/output (Not used)
40	F86	O	ATRAC block 11.6 msec timing signal output (Not used)
41	DOUT	O	Output of audio data signal to D/A converter
42	ADIN	I	Input of recording signal from A/D converter
43	ABCK	O	Bit clock signal output
44	ALRCK	O	L/R clock output
45 to 47	SA2 to SA0	O	Address signal output (Not used)

* O/Z: In case of no output data, it becomes high impedance

Pin No.	Pin Name	I/O	Function
48, 49	A11, A10	O	Address signal output (Not used)
50	VSS	—	Ground
51	VDD	—	Power supply (+5V)
52 to 55	A03 to A00	O	Address signal output
56 to 60	A04 to A08	O	Address signal output
61	XOE	O	Output enable control signal output
62	XCAS	O	Column address strobe signal output
63	VSS	—	Ground
64	XCS	O	Chip select signal output (Not used)
65	A09	O	Address signal output
66	XRAS	O	Row address strobe signal output
67	XWE	O	Read/write control signal output
68, 69	D1, D0	I/O	Data signal input/output
70 to 74	D2 to D6	I/O	
75	VSS	—	Ground
76	D7	I/O	Data signal input/output (Not used)
77	ERR	I/O	Input/output of error (C2PO) data to external RAM (Not used)
78	EXTC2R	I	External RAM selection input for error data writing (“H”: External RAM) (Fixed at “L”)
79	BUSY	O	RAM access BUSY signal output (Not used)
80	EMP	O	EMPTY or immediately before FULL of ATRAC data (When DSC=ASC+1: “H”) (Not used)
81	FUL	O	FULL or immediately before EMPTY of ATRAC data (When ASC=DSC+1: “H”) (Not used)
82	EQL	O	ATRAC data EMPTY (When DSC=ASC: “H”) (Not used)
83	MDLK	O	Indicates recording/playback data main/sub (“H”: Sub, Linking: “L”: Main) (Not used)
84	CPSY	O	Interpolation sync signal output (Not used)
85	CTMD0	O	DSC counter mode output (Not used)
86	CTMD1	O	
87	SPO	O	System clock (512fs=22.5792 MHz) signal output
88	VSS	—	Ground
89	MDSY	O	Main data sync detection signal output (Not used)
90	LRCK	I	L/R clock signal input (44.1 kHz)
91	BCK	I	Bit clock signal input (2.8224 MHz)
92	C2PO	I	C2PO signal input (Shows data error status) Playback: C2PO (“H”) Digital recording: D In-Vflag Analog recording: “L”
93	DATA	I/O	Recording: Recording audio data signal output Playback: Playback audio data signal input
94	DIDT	I	Input of digital audio input 16-bit data from CXD2535CR
95	DODT	O	Output of digital audio output 16-bit data to CXD2535CR
96	DIRCPB	O	Disc drive and EFM encoder/decoder recording/playback mode output (Not used)
97	MIN	I	External monitor signal input
98	SPOSL	I	Pin 87 (SPO) input/output switching input pin (“L”:IN “H”:OUT) (Not used) (Fixed at “H”)
99	MCK	O	RAM controller internal master clock output (Not used)
100	VSS	—	Ground

• IC207 Sampling Rate Converter, Digital Filter (MSM9404AGS-BX)/DIG board

Pin No.	Pin Name	I/O	Function
1	DO	O	Data output (Not used)
2	SEL	I	Data select control input “L”:DI0 → DO, “H”:DI1 → DO (Fixed at “L”)
3	SRDT	O	Serial data output
4	SWDT	I	Serial data input
5	SCK	I	Serial clock input
6	XLAT	I	Serial latch pulse input
7	INIT	I	Initialize input “L”:Reset
8	NC	—	Not used
9	VDD	—	Power supply (+3.3V)
10	NC	—	Not used
11	RBPH	O	Ring buffer R/W phase control monitor signal output “L”:Control OFF (Not used)
12	STA	O	Fs conversion rate measurement state monitor signal output “L”:High accuracy “H”:High speed response mode (Not used)
13	FRS	I	Input/output Fs rate measurement time selection input “L”:High accuracy “H”:High speed response mode (Fixed at “L”)
14	FRM	I	Input/output Fs rate measurement mode signal input “L”:Automatic, “H”:Manual (Fixed at “L”)
15	SLAVE	I	Output sync mode selection input “L”:Slave, “H”:Master (Fixed at “L”)
16	TEST5	I	Test pin (Fixed at “L”)
17	TB7	I/O	Test bus input/output (Open)
18	MDO0	I	Data output serial data format setting input (Fixed at “L”)
19	MDO1	I	
20	MUTE	I	Output mute setting input “L”:Muted (DATAO only)
21	DATAO	O	Data output (Fso output)
22	BCKO	I/O	Data output bit clock input/output
23	LRCKO	I/O	Data output Fso word clock input/output
24	TEST4	I	Test pin (Fixed at “L”)
25	GND	—	Ground
26	XI	I	512 Fso output line master clock input
27	GND	—	Ground
28	XO	O	Clock output
29	XOO	O	Output line master clock output (Not used)
30	VDD	—	Power supply (+3.3V)
31	NC	—	Not used
32 to 34	TB6 to TB4	I/O	Test bus input/output (Open)
35	MAO0	I	D/A output serial data format setting input (Fixed at “L”)
36	MAO1	I	
37	ALRKO	O	D/A output word clock output Data changes at “L”→“H” edge (Not used)
38	ABCKO	O	D/A output bit clock output Data changes at “L”→“H” edge (Not used)
39	NC	—	Not used
40	VDD	—	Power supply (+3.3V)

Pin No.	Pin Name	I/O	Function
41	NC	—	Not used
42	DAOR	O	Rch D/A 8Fso, 4Fso data output (Not used)
43	DAOL	O	Lch D/A 8Fso, 4Fso data output (Not used)
44	TEST3	I	Test pin (Fixed at “L”)
45	DEMP	I	Deemphasis setting input “L”:OFF (Fixed at “L”)
46	FS1	I	Deemphasis setting input Fsi frequency selection input (Fixed at “L”)
47	FS2	I	
48 to 50	TB3 to TB1	I/O	Test bus input/output (Open)
51	DATAI	I	Data input
52	LRCKI	I	Input data 1Fs word clock input (Schmidt)
53	BCKI	I	Input data bit clock input
54	FIMCK	I	Input data line Fs reference input and master clock input
55	FIMO	O	Master clock output
56	GND	—	Ground
57	TEST2	I	Test pin (Fixed at “L”)
58	TEST1	I	The second reset signal input from system controller
59	FIS	I	FIMCK frequency division rate setting input “L”:1/1 (256 Fs), “H”:1/2 (512 Fs) (Fixed at “H”)
60	MI0	I	Input data format setting input (Fixed at “H”)
61	MI1	I	Input data format setting input (Fixed at “L”)
62	DI0	I	Data input (Not used)
63	DI1	I	
64	TB0	I/O	Test bus input/output (Open)

• IC301 Digital Filter (CXD8512Q)/AD board

Pin No.	Pin Name	I/O	Function
1	TEST	I	Test pin (Fixed at “L”)
2	NC	—	Not used
3	SYNC	I	Sync mode selection (Fixed at “L”)
4	INIT	I	Initialization input
5	NC	—	Not used
6	CFLG	O	Flag output for calibration (Not used)
7, 8	VDD	—	Power supply (+5V)
9	LRKI	I	LRKI input (8fs/2fs/fs) (Not used)
10	BKI	I	BKI input (8fs/2fs/fs) (Not used)
11	NC	—	Not used
12	DLI	I	Lch data input (8fs/2fs/fs) (Not used)
13	DRI	I	Rch data input (8fs/2fs/fs) (Not used)
14	IFLG	O	Input side sync flag output (Not used)
15, 16	NC	—	Not used
17	FE	I	Test pin (Fixed at “L”)
18	AL2	I	Lch data input (64fs) (Not used)
19	AR2	I	Rch data input (64fs) (Not used)
20	AL1	I	Lch data input (64fs)
21	AR1	I	Rch data input (64fs)
22, 23	Vss	—	Ground
24, 25	CVss	—	
26	FCLK	O	FE clock output (128fs)
27	MCLK	I	Master clock input (256fs)
28	CVDD	—	Power supply (+5V)
29	NC	—	Not used
30	IBIT	I	Data input word length selection (64fs) (Fixed at “L”)
31	NC	—	Not used
32	Vss	—	Ground
33	SCALE	I	Test pin (Fixed at “L”)
34	ISEL1	I	Input selection (Fixed at “L”)
35	ISEL2	I	Input selection (Fixed at “L”)
36	NC	—	Not used
37	DITH	I	Dither (Not used)
38	BOOST	I	Boost (Not used)
39	VDD	—	Power supply (+5V)
40	MODE	I	MODE data input (Not used)
41	SHIFT	I	SHIFT clock input (Not used)
42	LATCH	I	LATCH input (Not used)
43	NC	—	Not used
44	LC	I	Low cut (Not used)
45	TEST	I	Test pin (Fixed at “L”)

Pin No.	Pin Name	I/O	Function
46	NC	—	Not used
47	OSEL	I	Test pin (Fixed at “L”)
48	OBIT	I	Output data word length selection “H”: 24 bits, “L”: 16 bits (Fixed at “H”)
49	DRO	O	Rch data output (Not used)
50	DLO	O	Lch data output
51	NC	—	Not used
52, 53	Vss	—	Ground
54	BCK	I/O	SYNC “H”: BCK output, “L”: BCK input
55	NC	—	Not used
56	LRCK	I/O	SYNC “H”: LRCK output, “L”: LRCK input
57	OFLG	O	Output side sync flag output (Not used)
58	VDD	—	Power supply (+5V)
59	OVR	O	Rch overflow flag output (Not used)
60	OVL	O	Lch overflow flag output (Not used)

• IC501 Noise Shaper, Digital Filter (CXD8595Q)/DA board

Pin No.	Pin Name	I/O	Function
1	PLMG2	I	4 bit conversion data setting pin in SCD mode (Fixed at “L”)
2	VDD	—	Power supply (+5V)
3	NSDOL4	O	Noise shaping data Lch parallel output 4 (MSB) (Not used)
4	NSDOL3	O	Noise shaping data Lch parallel output 3 (4SB) (Not used)
5	NSDOL2	O	Noise shaping data Lch parallel output 2 (2SB) (Not used)
6	NSDOL1	O	Noise shaping data Lch parallel output 1 (LSB) (Not used)
7, 8	NC	—	Not used
9, 10	VDD	—	Power supply (+5V)
11	NC	—	Not used
12	64FSI	I	64 Fs clock input
13	NSDOR1	O	Noise shaping data Rch parallel output 1 (LSB) (Not used)
14	NSDOR2	O	Noise shaping data Rch parallel output 2 (2SB) (Not used)
15	NSDOR3	O	Noise shaping data Rch parallel output 3 (4SB) (Not used)
16	NSDOR4	O	Noise shaping data Rch parallel output 4 (MSB) (Not used)
17	MCKIN	I	Master clock input (256 Fs)
18	VDD	—	Power supply (+5V)
19	PLMG1	I	4 bit conversion data setting pin in SCD mode (Fixed at “L”)
20	VSS	—	Ground
21	TEST3	I	Test pin (Fixed at “L”)
22	TEST4	I	
23	DFLRCKO	O	Digital filter data LR clock output
24	DFDTOR	O	Digital filter data Rch data output
25	NC	—	Not used
26	MODE	I	Mode setting pin “L”:CD mode, “H”:DSD mode (Fixed at “L”)
27	DRPOL	I	Rch data polarity setting pin “L”:Positive phase (Fixed at “L”)
28	OVFLAG	O	Digital filter output overflow flag output “H”:Active (Fixed at “L”)
29	MUTEL	O	Mute flag output (Lch) (Not used)
30	MUTER	O	Mute flag output (Rch) (Not used)
31	MTPOL	I	Mute flag polarity setting pin “L”:L active, “H”:H active (Not used)
32	INAF	O	Sync deviation detection flag “H”:Active (Sync deviation detection)
33	DINIT	O	External INIT signal delay signal output (Not used)
34	CKVDD	—	Power supply (+5V) (Clock system)
35	128FSO	O	128 Fs clock output (Not used)
36	NC	—	Not used
37	INVI	I	384 Fs generation three times buffer input (Not used)
38	INVO1	O	First stage buffer output for three times (Not used)
39	INVO2	O	Second stage buffer output for three times (Not used)
40	NC	—	Not used

Pin No.	Pin Name	I/O	Function
41, 42	VSS	—	Ground
43	BCKI	I	Bit clock input
44	DATAI	I	Data input
45	LRCKI	I	LR clock input
46	INIT	I	Initialize input “L”:Reset
47	ATT	I	Serial data input
48	SHIFT	I	Serial shift clock input
49	LATCH	I	Serial latch clock input
50	SYSM	I	External mute signal input “H”:Active (Fixed at “L”)
51	NRGCLR	I	N/S calculation section register clear signal input “H”:Active (Fixed at “L”)
52	IFSELD	I	Data line input signal voltage level selection pin (Fixed at “L”)
53	IFSELC	I	Control line input signal voltage level selection pin (Fixed at “L”)
54	NC	—	Not used
55	SBCKI	I	LR clock input (during SCD mode) (Not used)
56	SDATAR	I	Bit clock input (during SCD mode) (Not used)
57	SDATAL	I	Data input (during SCD mode) (Not used)
58	NC	—	Not used
59	DFDTOL	O	Digital filter serial data Lch output
60	DFBCKO	O	Digital filter serial data output bit clock output
61	DFDTEN	I	Digital filter data output “L”:OFF, “H”:ON
62	TEST1	I	Test pin (Fixed at “L”)
63	TEST2	I	
64	VSS	—	Ground

SECTION 7 EXPLODED VIEWS

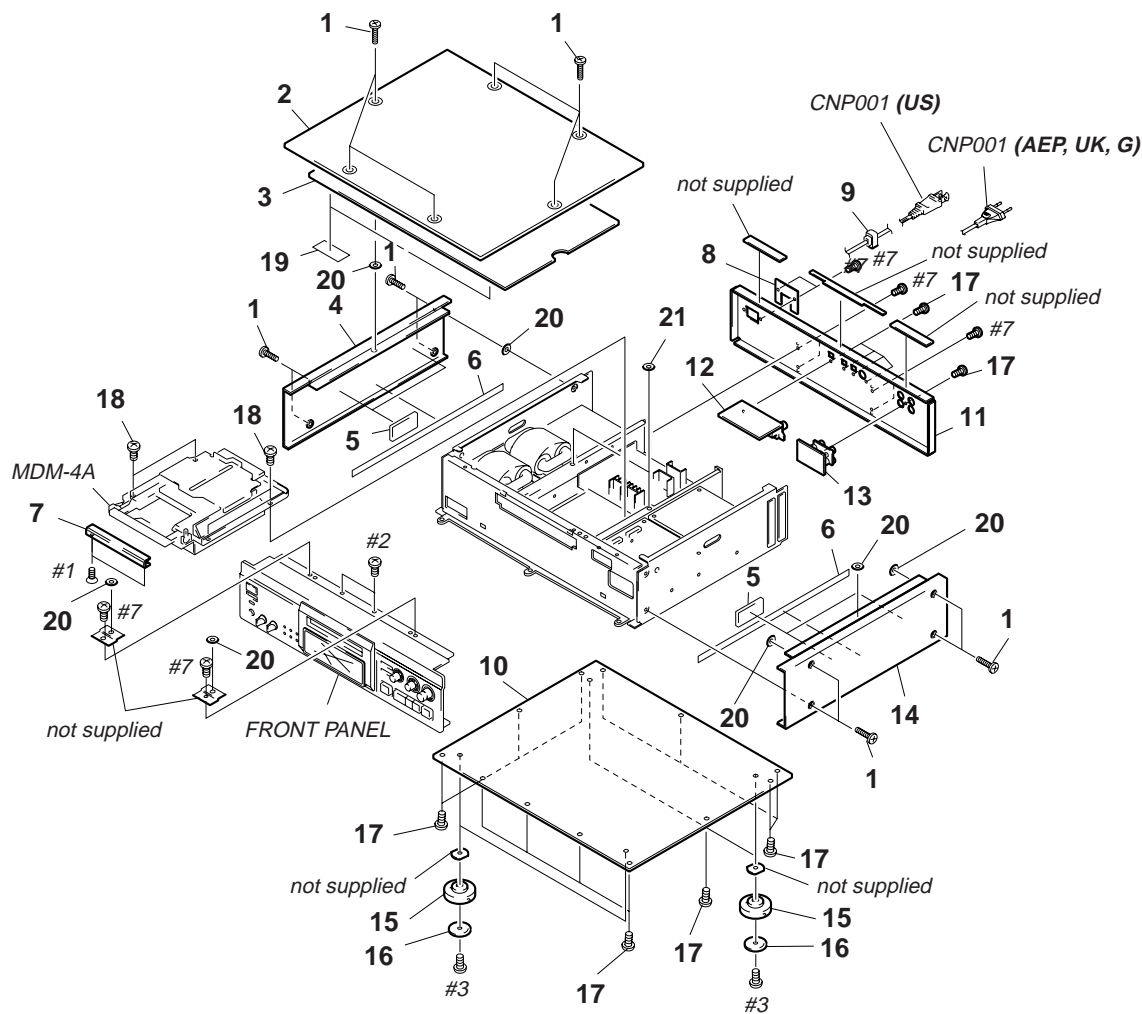
NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
KNOB, BALANCE (RED)
↓
Cabinets color

- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
G : German model

The components identified by mark \triangle or dotted line with mark \triangle are critical for safety.
Replace only with part number specified.

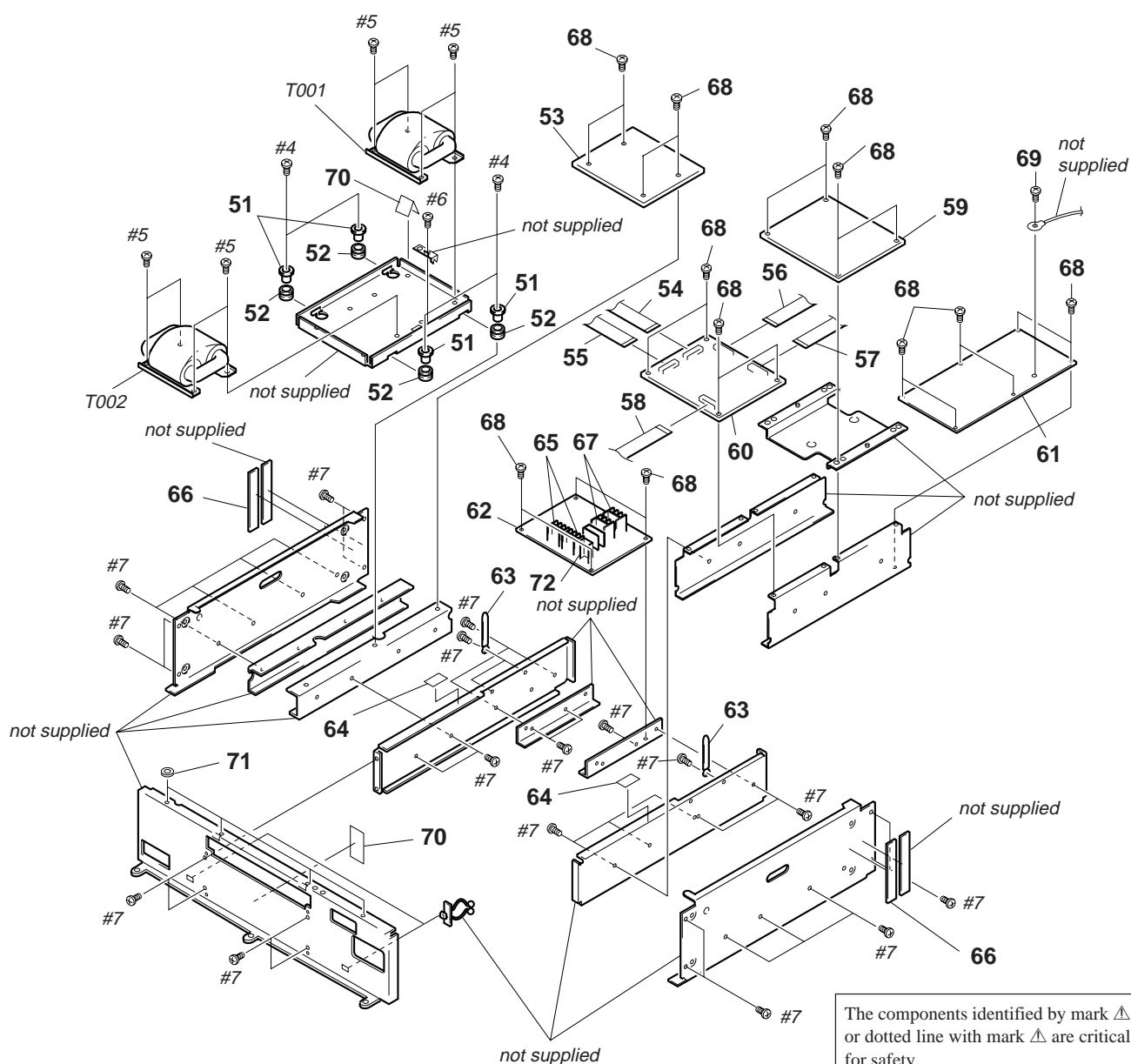
7-1. MAIN SECTION



Ref. No.	Part No.	Description	Remark
1	4-976-827-01	SCREW, FLAT HEAD (BLACK)	
1	4-976-827-11	SCREW, FLAT HEAD (GOLD)	
2	4-969-821-01	CASE (TOP PLATE)(BLACK)	
2	4-969-821-11	CASE (TOP PLATE)(GOLD)	
* 3	A-4660-735-A	REINFORCEMENT (TOP PLATE) ASSY	
4	4-969-823-01	PLATE (L), SIDE (BLACK)	
4	4-969-823-11	PLATE (L), SIDE (GOLD)	
5	4-972-438-01	ABSORBENT, VIBRATION	
6	4-972-439-01	SPACER (SCREW HEAD)	
7	4-987-666-01	PANEL, LOADING (GOLD)	
7	4-987-666-11	PANEL, LOADING (BLACK)	
* 8	4-923-873-01	BRACKET, CORD STOPPER	
* 9	3-703-244-00	BUSHING (2104), CORD (AEP,UK,G)	
9	4-916-783-01	BUSHING, CORD (US)	
* 10	4-987-539-01	PLATE, BOTTOM	

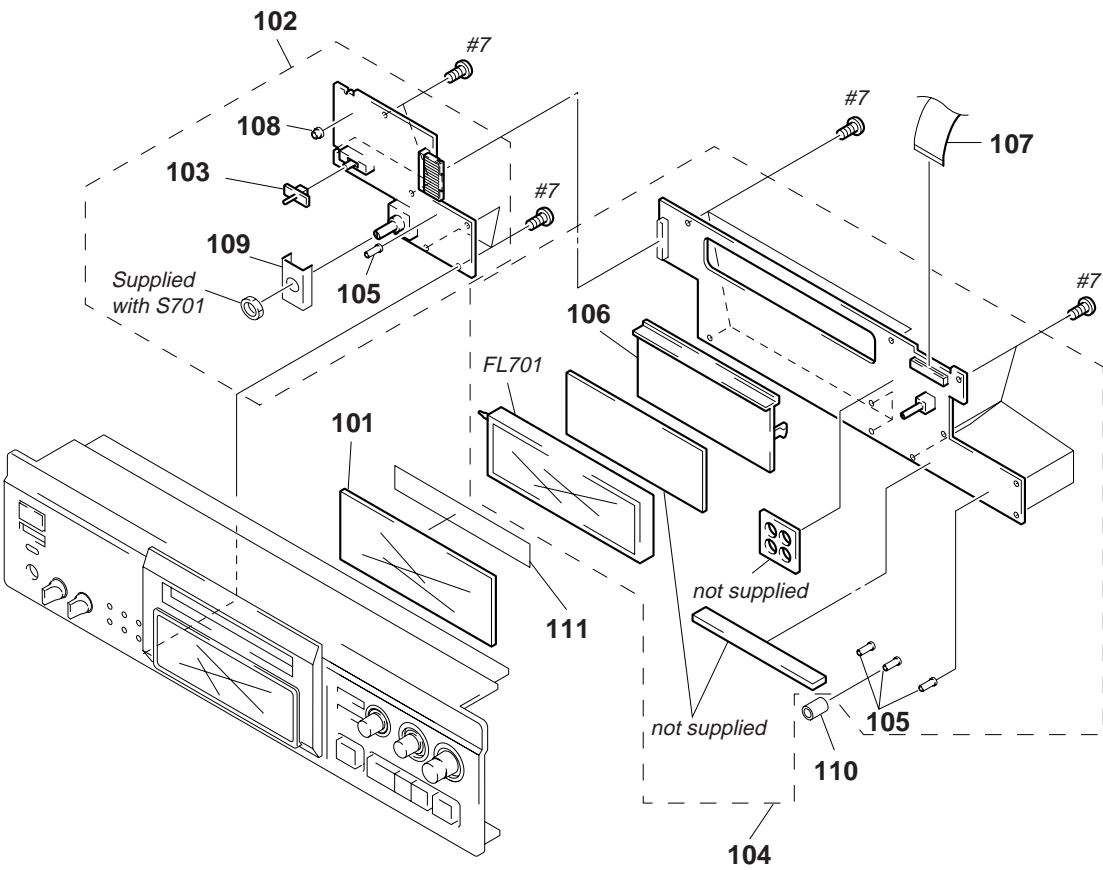
Ref. No.	Part No.	Description	Remark
* 11	4-987-511-22	PANEL, BACK (AEP,UK,G)	
* 11	4-987-511-31	PANEL, BACK (US)	
* 12	A-4699-457-A	DIO BOARD, COMPLETE	
* 13	1-664-817-11	PJ BOARD	
14	4-969-824-01	PLATE (R), SIDE (BLACK)	
14	4-969-824-11	PLATE (R) SIDE (GOLD)	
15	4-970-487-01	FOOT (F50180S)	
16	4-970-124-11	CUSHION (F50180S)	
17	4-929-074-01	SCREW (3X8)	
18	4-974-510-01	SCREW (+BV 3X8 B)	
19	9-911-830-XX	SHEET, HB	
20	4-949-302-31	WASHER (GREEN t 0.25)	
21	4-945-431-01	WASHER (BLACK t 0.8)	
\triangle CNP001	1-558-568-21	CORD, POWER (AEP,UK,G)	
\triangle CNP001	1-559-583-21	CORD, POWER (US)	

7-2. CHASSIS SECTION



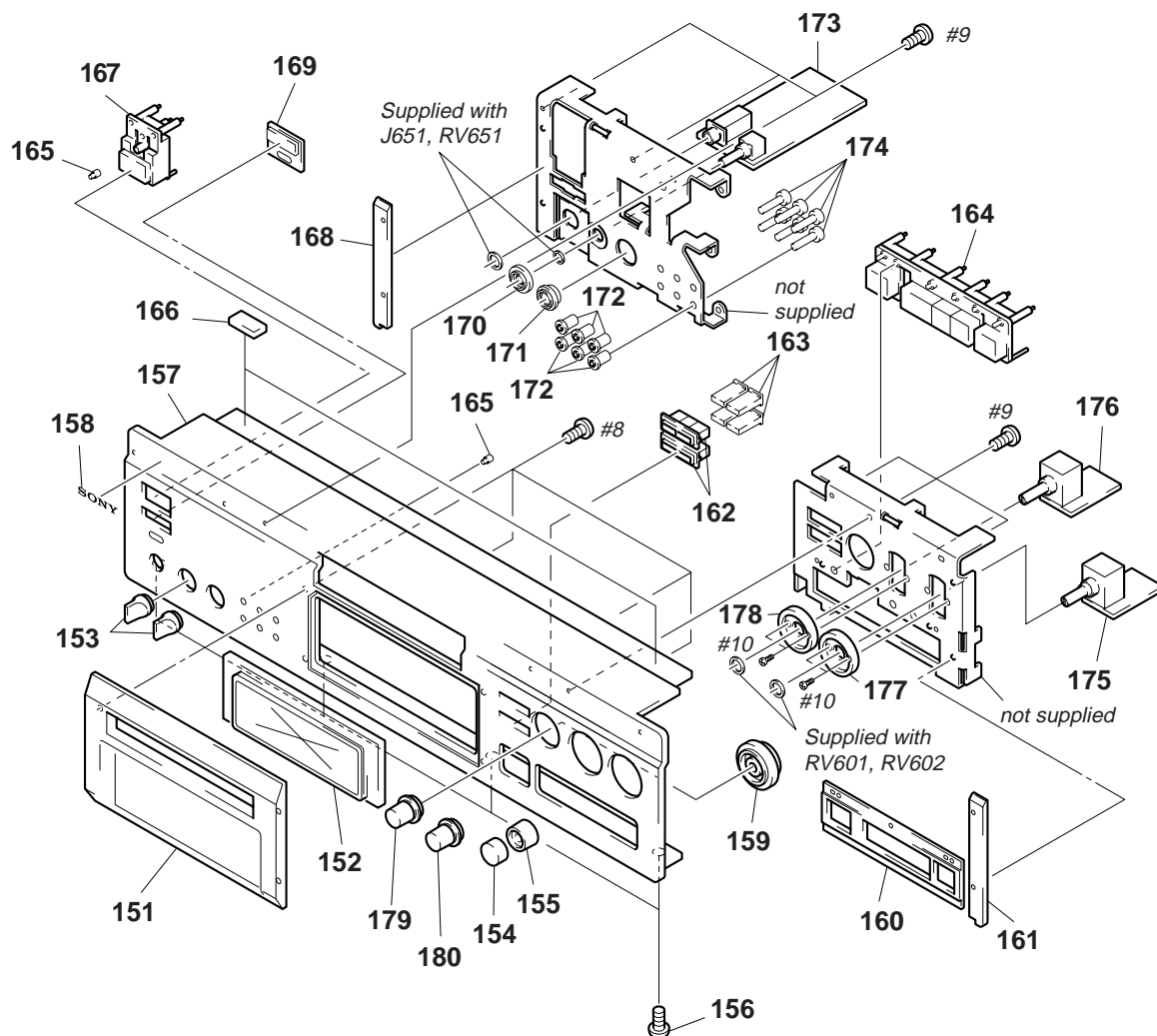
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	4-928-032-01	COLLAR (A)		64	3-846-312-11	SPACER (E)	
* 52	4-888-798-00	BUSHING, RUBBER		* 65	4-363-146-00	HEAT SINK, V.OUT	
* 53	1-664-815-11	AC BOARD		66	4-972-440-01	SPACER	
54	1-782-216-11	WIRE (FLAT TYPE)(30 CORE)		* 67	4-921-402-01	HEAT SINK	
55	1-782-215-11	WIRE (FLAT TYPE)(18 CORE)		68	4-974-510-01	SCREW (+BV 3X8 B)	
56	1-777-738-11	WIRE (FLAT TYPE)(26 CORE)		69	2-259-121-01	SCREW, TR	
57	1-777-737-11	WIRE (FLAT TYPE)(16 CORE)		70	3-831-441-XX	CUSHION	
58	1-777-735-11	WIRE (FLAT TYPE)(18 CORE)		71	4-945-431-01	WASHER	
* 59	A-4699-453-A	AD BOARD, COMPLETE		* 72	3-309-144-21	HEAT SINK	
* 60	A-4699-589-A	DIG BOARD, COMPLETE (US)		▲ T001	1-431-178-11	TRANSFORMER, POWER (AEP,UK,G)	
* 60	A-4699-593-A	DIG BOARD, COMPLETE (AEP,UK,G)		▲ T001	1-431-180-11	TRANSFORMER, POWER (US)	
* 61	A-4699-454-A	DA BOARD, COMPLETE		▲ T002	1-431-179-11	TRANSFORMER, POWER (AEP,UK,G)	
* 62	A-4699-455-A	PW BOARD, COMPLETE (US)		▲ T002	1-431-181-11	TRANSFORMER, POWER (US)	
* 62	A-4699-591-A	PW BOARD, COMPLETE (AEP,UK,G)					
63	3-703-397-01	STOPPER, WIRING					

7-3. FRONT PANEL SECTION 1



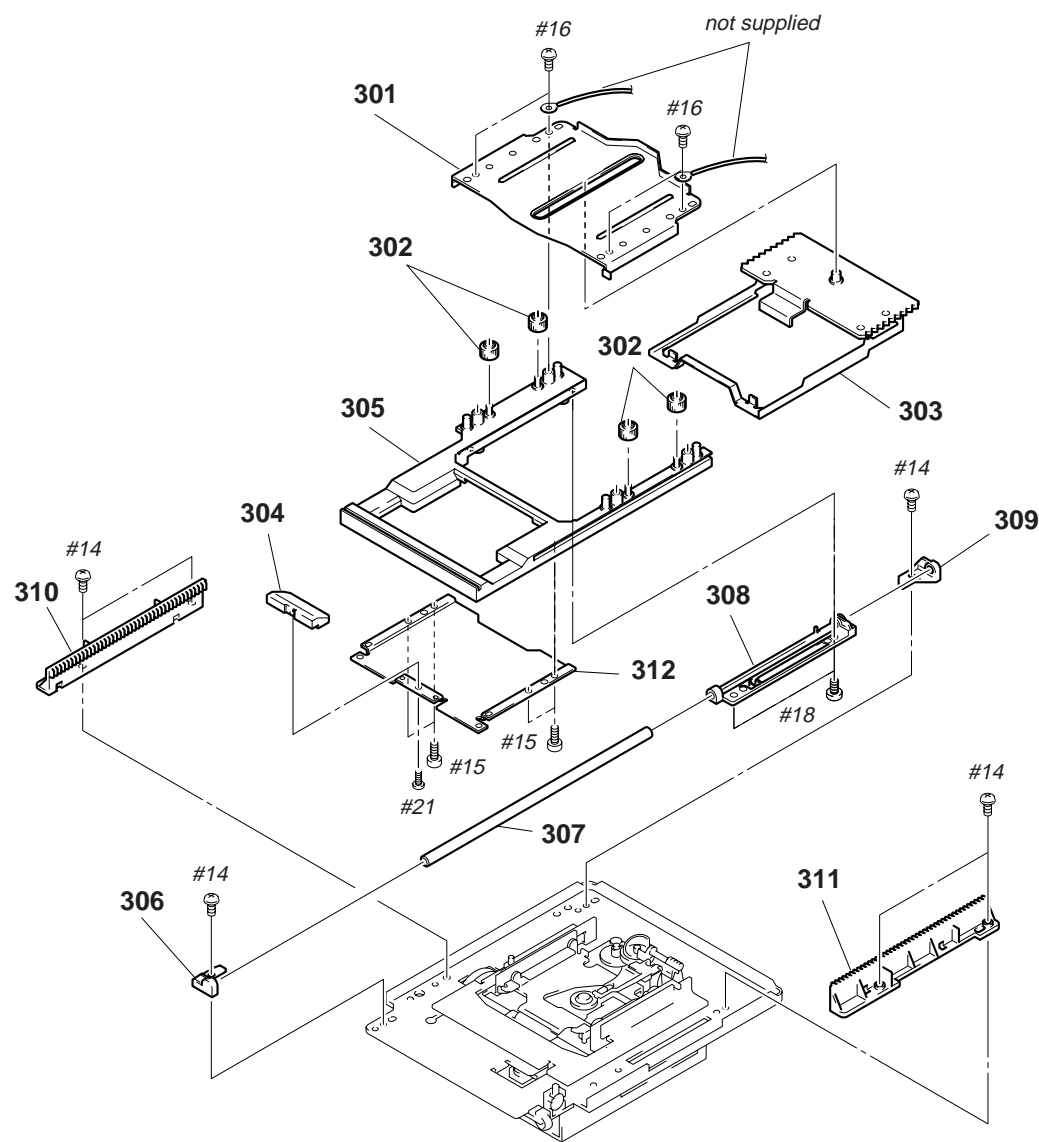
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	4-987-518-01	FILTER		107	1-777-736-11	WIRE (FLAT TYPE)(26 CORE)	
* 102	A-4699-460-A	PSW BOARD, COMPLETE		* 108	4-972-608-01	HOLDER (DIA. 5), LED	
103	4-971-774-01	KNOB (TIMER)(BLACK)		109	4-976-360-02	REINFORCEMENT (CONT)	
103	4-971-774-21	KNOB (TIMER)(GOLD)					
* 104	A-4699-459-A	DISP BOARD, COMPLETE		* 110	4-988-382-01	COVER (LED)	
				111	4-989-035-01	CUSHION (FL)	
* 105	3-362-478-11	HOLDER (T), LED		FL701	1-517-620-11	INDICATOR TUBE, FLUORESCENT	
* 106	4-987-501-01	HOLDER (FL)					

7-4. FRONT PANEL SECTION 2



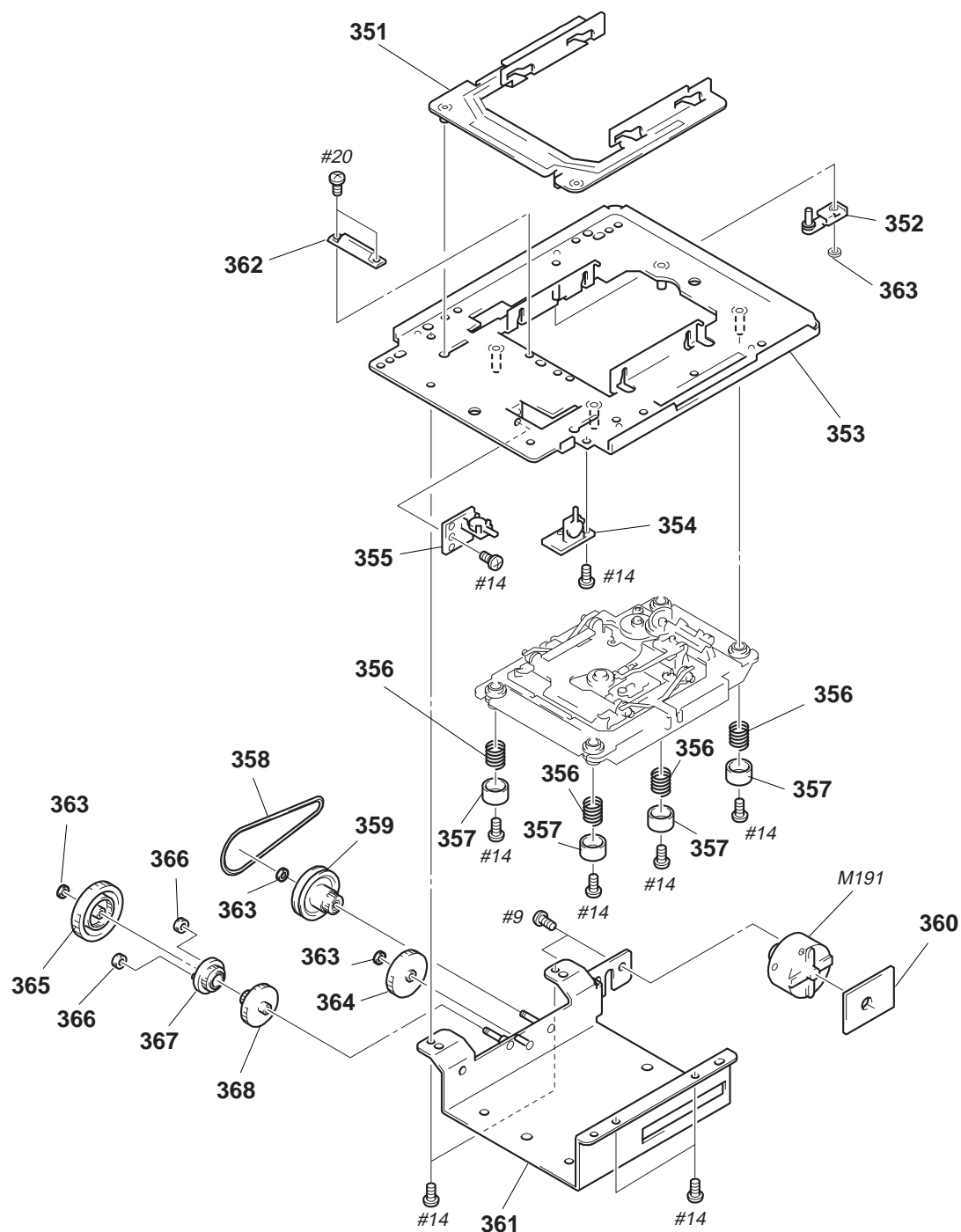
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
151	4-987-495-01	PANEL (GOLD)(ESCUTCHEON)		165	4-987-519-01	INDICATOR (D2)	
151	4-987-495-11	PANEL (BLACK)(ESCUTCHEON)		166	9-911-842-XX	RUBBER (B)	
152	4-987-517-01	PLATE, INDICATION		167	4-987-496-01	BUTTON (POWER)(GOLD)	
153	4-987-527-01	KNOB (VOL)(GOLD)					
153	4-987-527-11	KNOB (VOL)(BLACK)		167	4-987-496-11	BUTTON (POWER)(BLACK)	
				168	4-987-502-01	PANEL (EDGE L)(GOLD)	
154	4-987-525-01	KNOB (REC R)(GOLD)		168	4-987-502-11	PANEL (EDGE L)(BLACK)	
154	4-987-525-11	KNOB (REC R)(BLACK)		169	4-987-520-01	WINDOW (REMOTE CONTROL)(GOLD)	
155	4-987-524-01	KNOB (REC L)(GOLD)		169	4-987-520-11	WINDOW (REMOTE CONTROL)(BLACK)	
155	4-987-524-11	KNOB (REC L)(BLACK)					
156	4-929-074-01	SCREW (3X8)		* 170	4-987-514-01	GUIDE (VOL)(GOLD)	
				* 170	4-987-514-11	GUIDE (VOL)(BLACK)	
157	4-987-494-01	PANEL, FRONT (GOLD)(AEP,UK,G)		* 171	4-987-515-01	GUIDE (INPUT)(GOLD)	
157	4-987-494-11	PANEL, FRONT (BLACK)(AEP,UK,G)		* 171	4-987-515-11	GUIDE (INPUT)(BLACK)	
157	4-987-494-21	PANEL, FRONT (BLACK)(US)		* 172	4-987-513-01	GUIDE (FUNC)	
158	4-942-568-01	EMBLEM (NO.5), SONY (BLACK)					
158	4-942-568-31	EMBLEM (NO.5), SONY (GOLD)		* 173	A-4699-461-A	HP BOARD, COMPLETE	
				174	4-987-522-01	BUTTON (FUNC)(GOLD)	
* 159	4-987-535-01	GUIDE (AMS)(GOLD)		174	4-987-522-11	BUTTON (FUNC)(BLACK)	
* 159	4-987-535-11	GUIDE (AMS)(BLACK)		* 175	1-664-821-11	A VOL BOARD	
160	4-987-500-01	ESCUTCHEON (GOLD)		* 176	1-664-822-11	D VOL BOARD	
160	4-987-500-11	ESCUTCHEON (BLACK)					
161	4-987-503-01	PANEL (EDGE R)(GOLD)		177	4-987-516-01	GUIDE (REC)(GOLD)	
				177	4-987-516-11	GUIDE (REC)(BLACK)	
161	4-987-503-11	PANEL (EDGE R)(BLACK)		178	4-987-516-21	GUIDE (REC)(GOLD)	
* 162	4-987-512-01	GUIDE (EDIT)(GOLD)		178	4-987-516-31	GUIDE (REC)(BLACK)	
* 162	4-987-512-11	GUIDE (EDIT)(BLACK)		179	4-987-526-01	KNOB (AMS)(GOLD)	
163	4-987-523-01	BUTTON (EDIT)(GOLD)					
163	4-987-523-11	BUTTON (EDIT)(BLACK)		179	4-987-526-11	KNOB (AMS)(BLACK)	
				180	4-987-526-21	KNOB (AMS)(WITH RED POINT)(GOLD)	
164	X-4947-844-1	BUTTON (PLAY) ASSY (GOLD)		180	4-987-526-31	KNOB (AMS)(WITH RED POINT)(BLACK)	
164	X-4947-845-1	BUTTON (PLAY) ASSY (BLACK)					

7-5. MECHANISM SECTION 1 (MDM-4A)



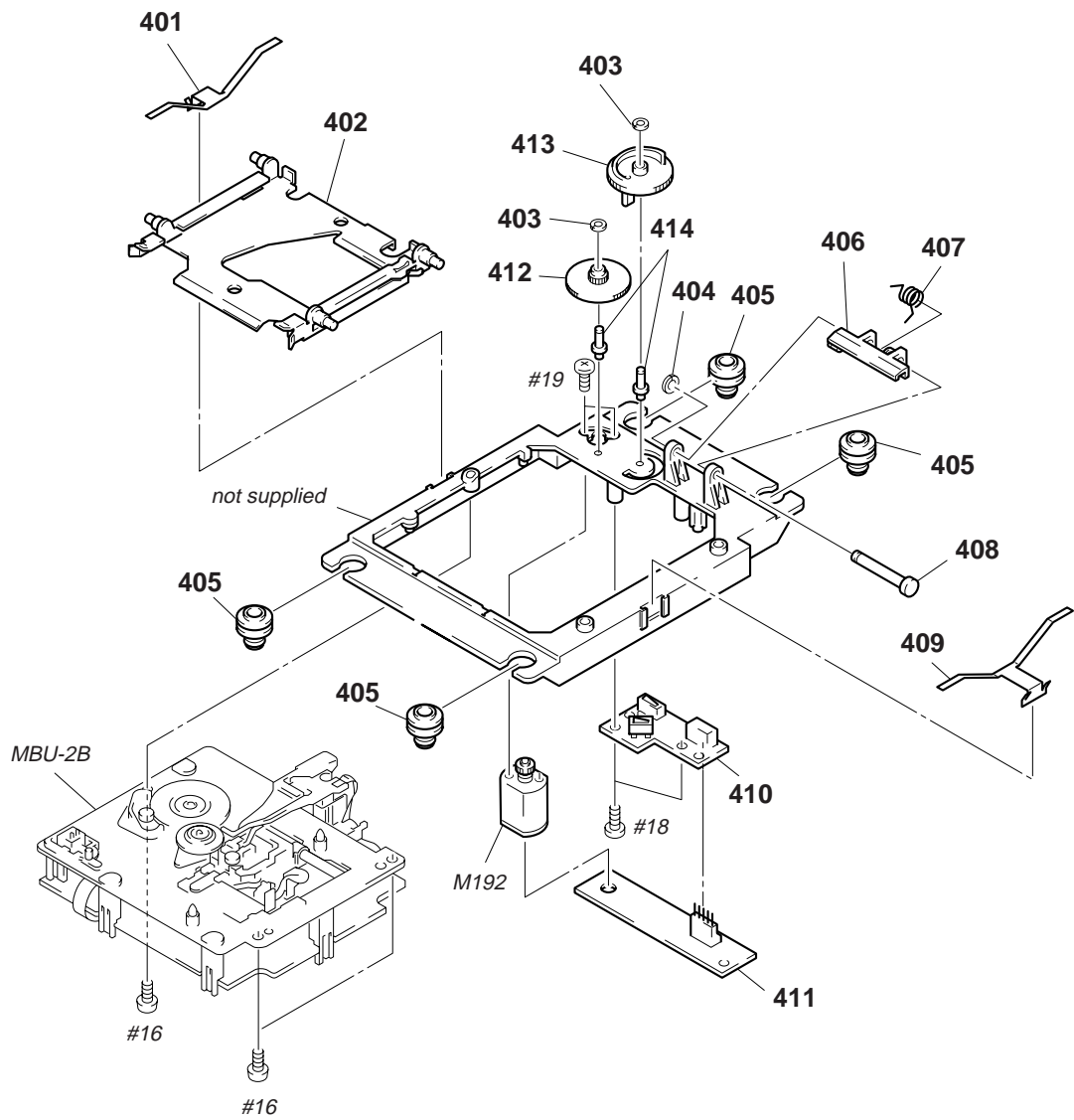
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
* 301	4-987-291-01	BRACKET (TOP)		* 308	4-987-294-01	GUIDE (SHAFT)	
302	4-987-293-01	GEAR (4)		309	4-987-271-01	STOPPER (SHAFT B)	
* 303	X-4947-820-1	SLIDER (D) ASSY		310	4-987-269-01	RACK (L)	
* 304	4-987-267-01	TABLE (EJECT)		311	4-987-268-01	RACK (R)	
* 305	4-987-282-01	TRAY		312	4-987-290-01	BRACKET (TRAY)	
306	4-987-270-01	STOPPER (SHAFT A)					
* 307	4-987-295-01	SHAFT					

7-6. MECHANISM SECTION 2 (MDM-4A)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
* 351	X-4947-819-1	SLIDER ASSY		* 361	X-4947-823-1	BRACKET (MOTOR) ASSY	
352	X-4947-937-1	LEVER (LOCK) ASSY		362	4-987-274-01	TABLE (LOADING)	
* 353	X-4947-818-1	CHASSIS ASSY		363	4-968-919-31	WASHER, STOPPER	
* 354	1-663-898-11	OUT BOARD		364	4-987-302-01	GEAR	
* 355	1-663-897-11	IN BOARD		365	4-987-298-01	GEAR (A), PLANET	
356	4-987-313-01	SPRING, COMPRESSION		366	4-987-301-01	GEAR (D), PLANET	
* 357	4-987-314-01	COLLAR (DAMPER)		367	4-987-300-01	GEAR (C), PLANET	
358	4-987-308-01	BELT (LOADING)		368	4-987-299-01	GEAR (B), PLANET	
359	4-987-297-01	GEAR, PULLEY		M191	X-4947-824-1	MOTOR (LOADING) ASSY	
* 360	1-663-900-11	LMOT BOARD					

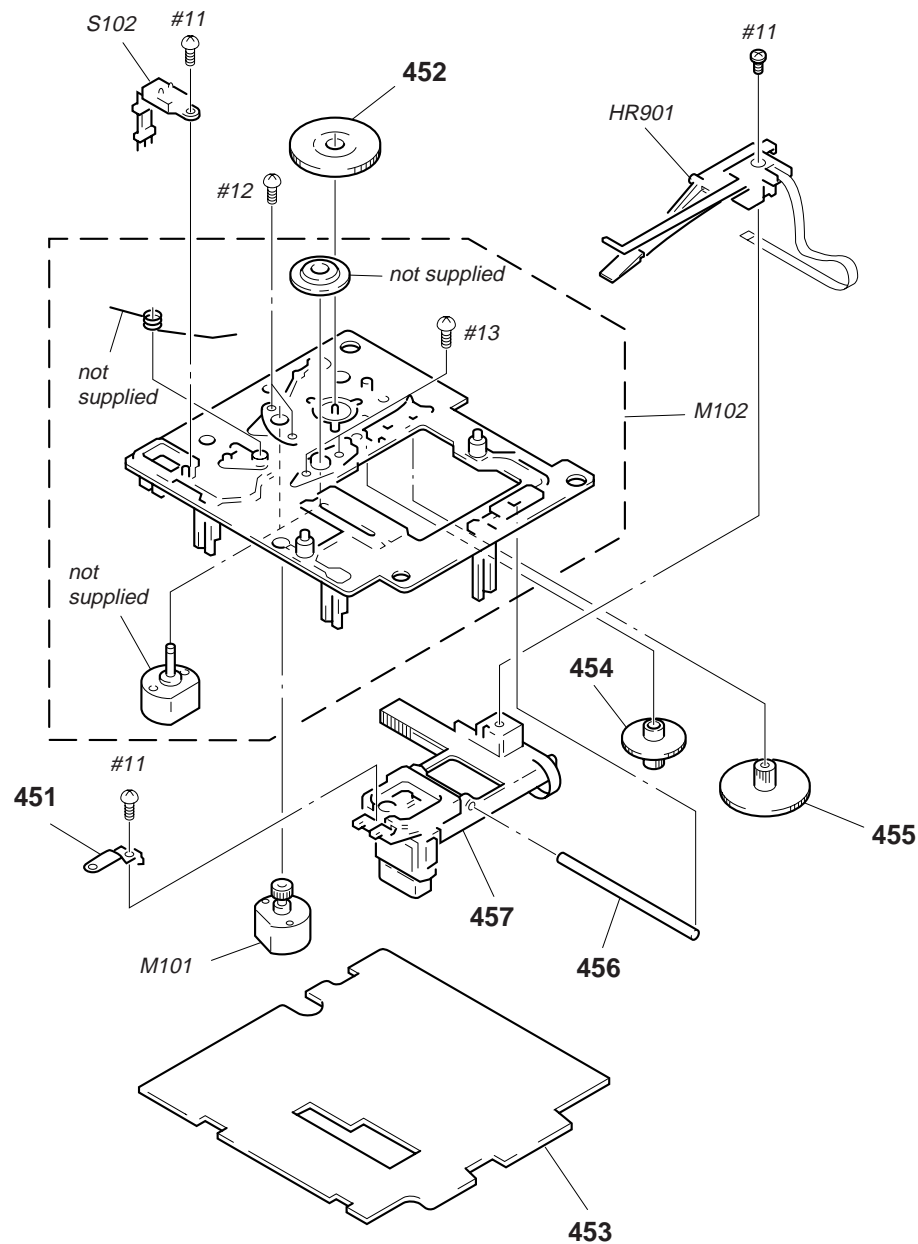
7-7. MECHANISM SECTION 3 (MDM-4A)



Ref. No.	Part No.	Description
401	4-987-273-01	SPRING (UDL), LEAF
* 402	X-4947-847-1	HOLDER ASSY
403	4-989-938-01	WASHER, STOPPER
404	4-968-919-31	WASHER, STOPPER
405	4-987-312-01	INSULATOR (MD)
406	4-987-306-01	LEVER (OWH)
407	4-987-307-01	SPRING (OWH), TORSION
* 408	4-989-233-01	SHAFT (OWH)

Ref. No.	Part No.	Description
409	4-987-272-01	SPRING (UDR), LEAF
* 410	1-663-896-11	HLIM BOARD
* 411	1-663-899-11	HMOT BOARD
412	4-987-276-01	GEAR (HEAD-B)
413	4-987-277-01	GEAR (HEAD-C)
* 414	4-987-278-01	SHAFT (HEAD)
M192	X-4947-821-1	MOTOR ASSY, HEAD

7-8. BASE UNIT SECTION (MBU-2B)



The components identified by mark \triangle or dotted line with mark \triangle are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
451	4-967-679-01	SPRING (OP), LEAF		\triangle 457	8-583-009-12	OPTICAL PICK-UP KMS-210A/J-N	
452	4-967-675-01	GEAR (SL-A)		HR901	1-500-304-21	HEAD, OVER WRITE	
* 453	A-4673-809-A	BD BOARD, COMPLETE		M101	A-4660-651-A	MOTOR ASSY (SLED)	
454	4-967-676-01	GEAR (SL-B)		M102	A-4660-650-A	CHASSIS ASSY, BU (SPINDLE)	
455	4-967-677-01	GEAR (SL-C)		S102	1-762-148-11	SWITCH, PUSH (2 KEY)(PROTECT/REFLECT)	
456	4-967-678-01	SHAFT (OP)					

AC

AD

SECTION 8 ELECTRICAL PARTS LIST

Note:

The components identified by mark Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
All resistors are in ohms
METAL: Metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F : nonflammable

- SEMICONDUCTORS
In each case, u: μ , for example:
uA...: μ A..., uPA...: μ PA..., uPB...: μ PB...,
uPC...: μ PC..., uPD...: μ PD...
- CAPACITORS
uF : μ F
- COILS
uH : μ H
- Abbreviation
G: German model

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
*	1-664-815-11	AC BOARD *****				C316	1-136-820-11	FILM 0.01uF 5% 100V			
		< CAPACITOR >				C317	1-136-820-11	FILM 0.01uF 5% 100V			
Δ C001	1-113-920-11	CERAMIC 0.0022uF 20% 250V (AEP,UK,G)				C318	1-164-732-11	CERAMIC 0.1uF 20% 50V			
Δ C002	1-113-920-11	CERAMIC 0.0022uF 20% 250V				C319	1-126-052-11	ELECT 100uF 20% 16V			
Δ C003	1-113-920-11	CERAMIC 0.0022uF 20% 250V				C320	1-164-732-11	CERAMIC 0.1uF 20% 50V			
Δ C004	1-113-920-11	CERAMIC 0.0022uF 20% 250V				C321	1-126-103-11	ELECT 470uF 20% 16V			
Δ C005	1-113-925-11	CERAMIC 0.01uF 20% 250V				C322	1-126-103-11	ELECT 470uF 20% 16V			
Δ C006	1-113-925-11	CERAMIC 0.01uF 20% 250V				C323	1-164-732-11	CERAMIC 0.1uF 20% 50V			
Δ C007	1-113-925-11	CERAMIC 0.01uF 20% 250V (AEP,UK,G)				C324	1-164-732-11	CERAMIC 0.1uF 20% 50V			
		< CONNECTOR >				C325	1-164-732-11	CERAMIC 0.1uF 20% 50V			
CN002	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P				C326	1-164-732-11	CERAMIC 0.1uF 20% 50V			
CN003	1-564-321-00	PIN, CONNECTOR 2P				C327	1-128-201-11	ELECT 100uF 20% 50V			
* CN004	1-564-321-21	PIN, CONNECTOR 2P				C328	1-128-201-11	ELECT 100uF 20% 50V			
		< GROUND PLATE >				C329	1-126-023-11	ELECT 100uF 20% 25V			
* EP001	4-870-539-00	PLATE, GROUND				C330	1-126-023-11	ELECT 100uF 20% 25V			
		< LINE FILTER >				C331	1-126-023-11	ELECT 100uF 20% 25V			
Δ LF001	1-424-485-11	FILTER, LINE				C332	1-126-023-11	ELECT 100uF 20% 25V			
		< SWITCH >				C333	1-126-023-11	ELECT 100uF 20% 25V			
Δ S001	1-762-764-11	SWITCH, POWER (MAIN POWER)(AEP,UK,G)				C334	1-126-023-11	ELECT 100uF 20% 25V			
*****						C335	1-126-023-11	ELECT 100uF 20% 25V			
*	A-4699-453-A	AD BOARD, COMPLETE *****				C336	1-126-023-11	ELECT 100uF 20% 25V			
		< CAPACITOR >						< CONNECTOR >			
C301	1-164-159-11	CERAMIC 0.1uF 50V				CN301	1-580-463-11	SOCKET, CONNECTOR 16P			
C302	1-164-159-11	CERAMIC 0.1uF 50V				* CN302	1-564-509-11	PLUG, CONNECTOR 6P			
C303	1-164-159-11	CERAMIC 0.1uF 50V				CN303	1-564-511-11	PLUG, CONNECTOR 8P			
C304	1-126-923-11	ELECT 220uF 20% 10V				* CN304	1-564-508-11	PLUG, CONNECTOR 5P			
C305	1-164-159-11	CERAMIC 0.1uF 50V						< DIODE >			
C306	1-162-294-31	CERAMIC 0.001uF 10% 50V				D301	8-719-987-63	DIODE 1N4148M			
C307	1-164-159-11	CERAMIC 0.1uF 50V				D302	8-719-987-63	DIODE 1N4148M			
C308	1-164-159-11	CERAMIC 0.1uF 50V				D303	8-719-987-63	DIODE 1N4148M			
C309	1-164-159-11	CERAMIC 0.1uF 50V				D304	8-719-987-63	DIODE 1N4148M			
C310	1-164-159-11	CERAMIC 0.1uF 50V				D305	8-719-987-63	DIODE 1N4148M			
C311	1-164-159-11	CERAMIC 0.1uF 50V				D306	8-719-987-63	DIODE 1N4148M			
C312	1-164-159-11	CERAMIC 0.1uF 50V				D307	8-719-987-63	DIODE 1N4148M			
C313	1-164-732-11	CERAMIC 0.1uF 20% 50V				D308	8-719-987-63	DIODE 1N4148M			
C314	1-164-732-11	CERAMIC 0.1uF 20% 50V						< GROUND PLATE >			
C315	1-164-732-11	CERAMIC 0.1uF 20% 50V				* EP301	4-870-539-00	PLATE, GROUND			
						* EP302	4-870-539-00	PLATE, GROUND			
								< IC >			
						IC301	8-759-280-17	IC CXD8512Q			
						IC302	8-759-330-53	IC CXD8493M-E1			
						IC303	8-759-701-65	IC NJM79M05FA			
						IC304	8-759-604-35	IC M5F78M05L			
						IC305	8-759-712-02	IC NJM2114D			

Ref. No.	Part No.	Description	Remark				Ref. No.	Part No.	Description	Remark				
IC306	8-759-712-02	IC NJM2114D					*	A-4673-809-A	BD BOARD, COMPLETE					
IC307	8-759-712-02	IC NJM2114D							*****					
IC308	8-759-712-02	IC NJM2114D												
< COIL >						< CAPACITOR >								
L301	1-408-405-00	INDUCTOR	4.7uH				C101	1-104-913-11	TANTAL. CHIP	10uF	20%	16V		
L302	1-408-405-00	INDUCTOR	4.7uH				C102	1-163-038-91	CERAMIC CHIP	0.1uF		25V		
< RESISTOR >							C103	1-104-913-11	TANTAL. CHIP	10uF	20%	16V		
							C104	1-104-913-11	TANTAL. CHIP	10uF	20%	16V		
							C105	1-164-232-11	CERAMIC CHIP	0.01uF		50V		
R301	1-259-404-11	CARBON	100	5%	1/6W		C106	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V		
R302	1-259-380-11	CARBON	10	5%	1/6W		C107	1-164-232-11	CERAMIC CHIP	0.01uF		50V		
R303	1-259-380-11	CARBON	10	5%	1/6W		C108	1-164-232-11	CERAMIC CHIP	0.01uF		50V		
R304	1-259-380-11	CARBON	10	5%	1/6W		C109	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V		
R308	1-259-404-11	CARBON	100	5%	1/6W		C111	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V		
R309	1-259-380-11	CARBON	10	5%	1/6W		C112	1-164-232-11	CERAMIC CHIP	0.01uF		50V		
R310	1-259-404-11	CARBON	100	5%	1/6W		C113	1-107-682-11	CERAMIC CHIP	1uF	10%	16V		
R311	1-249-504-11	CARBON	10	5%	1/4W		C114	1-163-038-91	CERAMIC CHIP	0.1uF		25V		
R312	1-249-504-11	CARBON	10	5%	1/4W		C115	1-107-682-11	CERAMIC CHIP	1uF	10%	16V		
R313	1-249-504-11	CARBON	10	5%	1/4W		C116	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V		
R314	1-249-504-11	CARBON	10	5%	1/4W		C117	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V		
R315	1-249-576-11	CARBON	10K	5%	1/4W		C119	1-104-913-11	TANTAL. CHIP	10uF	20%	16V		
R316	1-249-576-11	CARBON	10K	5%	1/4W		C121	1-126-395-11	ELECT	22uF	20%	16V		
R317	1-249-576-11	CARBON	10K	5%	1/4W		C122	1-164-232-11	CERAMIC CHIP	0.01uF		50V		
R318	1-249-576-11	CARBON	10K	5%	1/4W		C123	1-163-038-91	CERAMIC CHIP	0.1uF		25V		
R319	1-249-576-11	CARBON	10K	5%	1/4W		C124	1-163-038-91	CERAMIC CHIP	0.1uF		25V		
R320	1-249-576-11	CARBON	10K	5%	1/4W		C125	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V		
R321	1-249-588-91	CARBON	33K	5%	1/4W		C126	1-107-682-11	CERAMIC CHIP	1uF	10%	16V		
R322	1-249-588-91	CARBON	33K	5%	1/4W		C127	1-163-038-91	CERAMIC CHIP	0.1uF		25V		
R323	1-247-722-11	CARBON	5.6K	5%	1/4W F		C128	1-164-232-11	CERAMIC CHIP	0.01uF		50V		
R324	1-247-722-11	CARBON	5.6K	5%	1/4W F		C129	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V		
R325	1-249-469-11	CARBON	100K	5%	1/4W		C130	1-163-251-11	CERAMIC CHIP	100PF	5%	50V		
R326	1-249-469-11	CARBON	100K	5%	1/4W		C131	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V		
R327	1-249-552-11	CARBON	1K	5%	1/4W		C132	1-107-682-11	CERAMIC CHIP	1uF	10%	16V		
R328	1-249-552-11	CARBON	1K	5%	1/4W		C133	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V		
R329	1-249-995-11	CARBON	1M	5%	1/4W		C134	1-163-038-91	CERAMIC CHIP	0.1uF		25V		
R330	1-249-995-11	CARBON	1M	5%	1/4W		C135	1-163-038-91	CERAMIC CHIP	0.1uF		25V		
R331	1-249-995-11	CARBON	1M	5%	1/4W		C136	1-126-206-11	ELECT CHIP	100uF	20%	6.3V		
R332	1-249-995-11	CARBON	1M	5%	1/4W		C141	1-163-038-91	CERAMIC CHIP	0.1uF		25V		
*****							C142	1-163-251-11	CERAMIC CHIP	100PF	5%	50V		
*	1-664-821-11	AVOL BOARD					C143	1-163-251-11	CERAMIC CHIP	100PF	5%	50V		
		*****					C144	1-163-251-11	CERAMIC CHIP	100PF	5%	50V		
		< CONNECTOR >							C151	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
									C152	1-163-038-91	CERAMIC CHIP	0.1uF		25V
CN604	1-564-511-11	PLUG, CONNECTOR 8P					C155	1-104-916-11	TANTAL. CHIP	6.8uF	20%	20V		
< RESISTOR >							C160	1-104-601-11	ELECT CHIP	10uF	20%	10V		
							C161	1-104-601-11	ELECT CHIP	10uF	20%	10V		
							C163	1-164-232-11	CERAMIC CHIP	0.01uF		50V		
R601	1-249-461-11	CARBON	18K	5%	1/4W		C164	1-164-232-11	CERAMIC CHIP	0.01uF		50V		
R602	1-249-459-11	CARBON	12K	5%	1/4W		C166	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V		
R603	1-249-459-11	CARBON	12K	5%	1/4W		C167	1-163-038-91	CERAMIC CHIP	0.1uF		25V		
R604	1-249-461-11	CARBON	18K	5%	1/4W		C169	1-104-913-11	TANTAL. CHIP	10uF	20%	16V		
< VARIABLE RESISTOR >							C170	1-104-913-11	TANTAL. CHIP	10uF	20%	16V		
							C171	1-163-038-91	CERAMIC CHIP	0.1uF		25V		
RV601	1-225-371-11	RES, VAR, CARBON 50K/50K					C175	1-163-038-91	CERAMIC CHIP	0.1uF		25V		
(ANALOG REC LEVEL)							C176	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V		
*****							C177	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V		
							C178	1-163-038-91	CERAMIC CHIP	0.1uF		25V		
							C181	1-104-913-11	TANTAL. CHIP	10uF	20%	16V		

Ref. No.	Part No.	Description	Remark		Ref. No.	Part No.	Description	Remark	
C182	1-163-038-91	CERAMIC CHIP 0.1uF	25V		Q151	8-729-905-18	TRANSISTOR DTC144EU		
C183	1-163-038-91	CERAMIC CHIP 0.1uF	25V		Q162	8-729-101-07	TRANSISTOR 2SB798-DL		
C184	1-107-836-11	ELECT CHIP 22uF	8V	20%	Q163	8-729-905-12	TRANSISTOR DTA144EU		
C185	1-164-611-11	CERAMIC CHIP 0.001uF	500V	10%	Q164	8-729-924-19	TRANSISTOR DTA123JU		
C186	1-163-038-91	CERAMIC CHIP 0.1uF	25V		Q181	8-729-018-75	TRANSISTOR 2SJ278MY		
C191	1-126-395-11	ELECT 22uF	16V	20%	Q182	8-729-017-65	TRANSISTOR 2SK1764KY		
C192	1-163-038-91	CERAMIC CHIP 0.1uF	25V		< RESISTOR >				
C193	1-164-346-11	CERAMIC CHIP 1uF	16V		R101	1-216-077-00	METAL CHIP 15K	5%	1/10W
C194	1-126-206-11	ELECT CHIP 100uF	6.3V	20%	R102	1-216-073-00	METAL CHIP 10K	5%	1/10W
< CONNECTOR >					R103	1-216-073-00	METAL CHIP 10K	5%	1/10W
CN101	1-766-508-11	CONNECTOR, FFC/FPC (ZIF) 22P			R104	1-216-049-91	METAL GLAZE 1K	5%	1/10W
CN102	1-766-510-21	CONNECTOR, FFC/FPC 30P			R105	1-216-065-00	METAL CHIP 4.7K	5%	1/10W
CN103	1-766-509-21	CONNECTOR, FFC/FPC 18P			R106	1-216-133-00	METAL CHIP 3.3M	5%	1/10W
CN104	1-766-898-21	HOUSING, CONNECTOR (PC BOARD) 4P			R107	1-216-113-00	METAL CHIP 470K	5%	1/10W
< DIODE >					R110	1-216-077-00	METAL CHIP 15K	5%	1/10W
D101	8-719-988-62	DIODE 1SS355			R113	1-216-061-00	METAL CHIP 3.3K	5%	1/10W
D155	8-719-031-17	DIODE 1SS322-TE85L			R114	1-216-025-91	METAL GLAZE 100	5%	1/10W
D161	8-719-421-15	DIODE MA8027-L			R116	1-216-069-00	METAL CHIP 6.8K	5%	1/10W
D181	8-719-033-60	DIODE F1P2STP			R117	1-216-113-00	METAL CHIP 470K	5%	1/10W
D183	8-719-033-60	DIODE F1P2STP			R120	1-216-025-91	METAL GLAZE 100	5%	1/10W
< IC >					R121	1-216-097-91	METAL GLAZE 100K	5%	1/10W
IC101	8-752-072-68	IC CXA1981AR			R122	1-216-295-91	CONDUCTOR, CHIP (2012)		
IC102	8-759-243-19	IC TC7SU04F			R123	1-216-037-00	METAL CHIP 330	5%	1/10W
IC121	8-752-378-79	IC CXD2535CR			R124	1-216-025-91	METAL GLAZE 100	5%	1/10W
IC122	8-759-243-19	IC TC7SU04F			R125	1-216-025-91	METAL GLAZE 100	5%	1/10W
IC151	8-759-179-60	IC MPC17A38VMEL			R128	1-216-053-00	METAL CHIP 1.5K	5%	1/10W
IC171	8-759-504-12	IC X24C01S			R129	1-216-037-00	METAL CHIP 330	5%	1/10W
IC172	8-759-149-73	IC uPC842G2			R130	1-216-041-00	METAL CHIP 470	5%	1/10W
IC181	8-759-095-65	IC TC74ACT540FS			R131	1-216-073-00	METAL CHIP 10K	5%	1/10W
IC182	8-759-243-19	IC TC7SU04F			R132	1-216-097-91	METAL GLAZE 100K	5%	1/10W
IC191	8-759-822-99	IC L88MS05T-FA			R133	1-216-129-00	METAL CHIP 2.2M	5%	1/10W
< COIL >					R134	1-216-037-00	METAL CHIP 330	5%	1/10W
L101	1-414-234-11	INDUCTOR, FERRITE BEAD			R135	1-216-053-00	METAL CHIP 1.5K	5%	1/10W
L102	1-414-234-11	INDUCTOR, FERRITE BEAD			R136	1-216-041-00	METAL CHIP 470	5%	1/10W
L103	1-414-234-11	INDUCTOR, FERRITE BEAD			R137	1-216-025-91	METAL GLAZE 100	5%	1/10W
L105	1-414-234-11	INDUCTOR, FERRITE BEAD			R139	1-216-017-91	METAL GLAZE 47	5%	1/10W
L106	1-414-234-11	INDUCTOR, FERRITE BEAD			R140	1-216-017-91	METAL GLAZE 47	5%	1/10W
L121	1-414-234-11	INDUCTOR, FERRITE BEAD			R141	1-216-295-91	CONDUCTOR, CHIP (2012)		
L122	1-412-039-51	INDUCTOR CHIP 100uH			R142	1-216-073-00	METAL CHIP 10K	5%	1/10W
L151	1-412-622-51	INDUCTOR 10uH			R143	1-216-073-00	METAL CHIP 10K	5%	1/10W
L152	1-412-622-51	INDUCTOR 10uH			R144	1-216-025-91	METAL GLAZE 100	5%	1/10W
L153	1-412-039-51	INDUCTOR CHIP 100uH			R145	1-216-121-91	METAL GLAZE 1M	5%	1/10W
L154	1-412-039-51	INDUCTOR CHIP 100uH			R146	1-216-037-00	METAL CHIP 330	5%	1/10W
L155	1-410-980-51	INDUCTOR CHIP 1mH			R147	1-216-025-91	METAL GLAZE 100	5%	1/10W
L161	1-414-234-11	INDUCTOR, FERRITE BEAD			R148	1-216-045-00	METAL CHIP 680	5%	1/10W
L162	1-414-234-11	INDUCTOR, FERRITE BEAD			R150	1-216-295-91	CONDUCTOR, CHIP (2012)		
L195	1-233-316-21	FILTER, CHIP EMI			R151	1-216-097-91	METAL GLAZE 100K	5%	1/10W
< MOTOR >					R154	1-220-262-11	METAL GLAZE 680	5%	1/4W
M101	A-4660-651-A	MOTOR (SLED) ASSY			R155	1-220-262-11	METAL GLAZE 680	5%	1/4W
M102	A-4660-650-A	CHASSIS ASSY, BU (SPINDLE)			R158	1-216-121-91	METAL GLAZE 1M	5%	1/10W
< TRANSISTOR >					R161	1-216-057-00	METAL CHIP 2.2K	5%	1/10W
Q101	8-729-905-12	TRANSISTOR DTA144EU			R162	1-216-057-00	METAL CHIP 2.2K	5%	1/10W
					R163	1-216-057-00	METAL CHIP 2.2K	5%	1/10W
					R164	1-216-045-00	METAL CHIP 680	5%	1/10W
					R165	1-216-097-91	METAL GLAZE 100K	5%	1/10W
					R166	1-220-250-11	METAL GLAZE 10	5%	1/2W
					R167	1-216-065-00	METAL CHIP 4.7K	5%	1/10W

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
R169	1-219-724-11	METAL CHIP	1	1%	1/4W	C530	1-164-159-11	CERAMIC	0.1uF		50V
R170	1-216-073-00	METAL CHIP	10K	5%	1/10W	C531	1-124-721-11	ELECT	10uF	20%	50V
R171	1-216-073-00	METAL CHIP	10K	5%	1/10W	C532	1-164-159-11	CERAMIC	0.1uF		50V
R172	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	C533	1-126-052-11	ELECT	100uF	20%	16V
R174	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	C534	1-126-052-11	ELECT	100uF	20%	16V
R176	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	C535	1-164-732-11	CERAMIC	0.1uF	20%	50V
R178	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	C536	1-124-721-11	ELECT	10uF	20%	50V
R181	1-216-073-00	METAL CHIP	10K	5%	1/10W	C537	1-126-052-11	ELECT	100uF	20%	16V
R182	1-216-089-91	METAL GLAZE	47K	5%	1/10W	C539	1-126-052-11	ELECT	100uF	20%	16V
R183	1-216-089-91	METAL GLAZE	47K	5%	1/10W	C540	1-126-052-11	ELECT	100uF	20%	16V
R186	1-216-134-00	METAL CHIP	2.2	5%	1/8W	C541	1-126-052-11	ELECT	100uF	20%	16V
R187	1-216-134-00	METAL CHIP	2.2	5%	1/8W	C543	1-164-732-11	CERAMIC	0.1uF	20%	50V
< VARIABLE RESISTOR >						C544	1-136-165-00	FILM	0.1uF	5%	50V
RV101	1-241-396-11	RES, ADJ, METAL GLAZE 22K				C545	1-136-165-00	FILM	0.1uF	5%	50V
RV102	1-241-396-11	RES, ADJ, METAL GLAZE 22K				C547	1-124-724-11	ELECT	47uF	20%	50V
< SWITCH >						C548	1-124-724-11	ELECT	47uF	20%	50V
S101	1-572-467-61	SWITCH, PUSH (1 KEY)(LIMIT IN)				C549	1-136-165-00	FILM	0.1uF	5%	50V
*****						C550	1-136-165-00	FILM	0.1uF	5%	50V
*****						C551	1-126-052-11	ELECT	100uF	20%	16V
*****						C553	1-126-052-11	ELECT	100uF	20%	16V
*****						C554	1-164-732-11	CERAMIC	0.1uF	20%	50V
*****						C555	1-164-732-11	CERAMIC	0.1uF	20%	50V
*	A-4699-454-A	DA BOARD, COMPLETE				C556	1-130-973-00	FILM	0.022uF	5%	63V
*****						C557	1-130-973-00	FILM	0.022uF	5%	63V
< BUS BAR >						C558	1-126-103-11	ELECT	470uF	20%	16V
* BB501	1-560-242-71	BUS BAR 6P				C559	1-126-103-11	ELECT	470uF	20%	16V
< CAPACITOR >						C560	1-164-732-11	CERAMIC	0.1uF	20%	50V
C501	1-126-923-11	ELECT	220uF	20%	10V	C561	1-164-732-11	CERAMIC	0.1uF	20%	50V
C502	1-162-294-31	CERAMIC	0.001uF	10%	50V	C562	1-130-969-11	FILM	0.012uF	3%	100V
C503	1-164-159-11	CERAMIC	0.1uF		50V	C563	1-130-969-11	FILM	0.012uF	3%	100V
C504	1-126-923-11	ELECT	220uF	20%	10V	C564	1-130-969-11	FILM	0.012uF	3%	100V
C505	1-164-159-11	CERAMIC	0.1uF		50V	C565	1-130-969-11	FILM	0.012uF	3%	100V
C506	1-126-923-11	ELECT	220uF	20%	10V	C566	1-136-233-11	FILM	0.0047uF	3%	100V
C507	1-164-159-11	CERAMIC	0.1uF		50V	C567	1-136-233-11	FILM	0.0047uF	3%	100V
C508	1-164-159-11	CERAMIC	0.1uF		50V	C568	1-136-233-11	FILM	0.0047uF	3%	100V
C509	1-164-159-11	CERAMIC	0.1uF		50V	C569	1-136-233-11	FILM	0.0047uF	3%	100V
C510	1-126-923-11	ELECT	220uF	20%	10V	C570	1-136-810-11	FILM	220PF	5%	100V
C511	1-162-294-31	CERAMIC	0.001uF	10%	50V	C571	1-136-810-11	FILM	220PF	5%	100V
C512	1-126-923-11	ELECT	220uF	20%	10V	C572	1-136-810-11	FILM	220PF	5%	100V
C513	1-126-335-11	ELECT	220uF	20%	10V	C573	1-136-810-11	FILM	220PF	5%	100V
C514	1-164-159-11	CERAMIC	0.1uF		50V	C576	1-136-817-91	FILM	0.0033uF	5%	100V
C515	1-164-159-11	CERAMIC	0.1uF		50V	C577	1-136-817-91	FILM	0.0033uF	5%	100V
C516	1-126-335-11	ELECT	220uF	20%	10V	C580	1-136-814-11	FILM	0.001uF	5%	100V
C517	1-164-159-11	CERAMIC	0.1uF		50V	C581	1-136-814-11	FILM	0.001uF	5%	100V
C518	1-164-159-11	CERAMIC	0.1uF		50V	C582	1-136-960-11	FILM	0.1uF	10%	160V
C519	1-162-199-31	CERAMIC	10PF	5%	50V	C583	1-136-960-11	FILM	0.1uF	10%	160V
C520	1-162-199-31	CERAMIC	10PF	5%	50V	C584	1-104-646-11	CERAMIC	2.2uF	20%	50V
C521	1-126-335-11	ELECT	220uF	20%	10V	C585	1-104-646-11	CERAMIC	2.2uF	20%	50V
C522	1-126-335-11	ELECT	220uF	20%	10V	C586	1-136-259-11	FILM	0.1uF	3%	100V
C523	1-164-159-11	CERAMIC	0.1uF		50V	C587	1-136-259-11	FILM	0.1uF	3%	100V
C524	1-126-335-11	ELECT	220uF	20%	10V	C588	1-128-088-11	ELECT	220uF	20%	50V
C525	1-124-689-11	ELECT	1000uF	20%	16V	C589	1-128-088-11	ELECT	220uF	20%	50V
C526	1-130-973-00	FILM	0.022uF	5%	63V	C590	1-162-294-31	CERAMIC	0.001uF	10%	50V
C527	1-124-721-11	ELECT	10uF	20%	50V	C591	1-164-159-11	CERAMIC	0.1uF		50V
C528	1-130-973-00	FILM	0.022uF	5%	63V	C592	1-164-159-11	CERAMIC	0.1uF		50V
C529	1-124-721-11	ELECT	10uF	20%	50V	C593	1-162-294-31	CERAMIC	0.001uF	10%	50V
						C594	1-164-732-11	CERAMIC	0.1uF	20%	50V

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
C595	1-164-159-11	CERAMIC 0.1uF	50V			R505	1-259-380-11	CARBON 10 5%	1/6W		
		< CONNECTOR >				R506	1-259-380-11	CARBON 10 5%	1/6W		
CN501	1-573-150-11	SOCKET, CONNECTOR 18P				R507	1-259-380-11	CARBON 10 5%	1/6W		
* CN503	1-564-514-11	PLUG, CONNECTOR 11P				R508	1-259-404-11	CARBON 100 5%	1/6W		
* CN504	1-564-709-11	PIN, CONNECTOR (SMALL TYPE) 7P				R509	1-259-404-11	CARBON 100 5%	1/6W		
		< DIODE >				R512	1-259-380-11	CARBON 10 5%	1/6W		
D501	8-719-987-63	DIODE 1N4148M				R513	1-259-404-11	CARBON 100 5%	1/6W		
D502	8-719-987-63	DIODE 1N4148M				R514	1-259-404-11	CARBON 100 5%	1/6W		
D503	8-719-987-63	DIODE 1N4148M				R515	1-259-404-11	CARBON 100 5%	1/6W		
		< GROUND PLATE >				R516	1-259-404-11	CARBON 100 5%	1/6W		
* EP501	4-870-539-00	PLATE, GROUND				R517	1-259-404-11	CARBON 100 5%	1/6W		
* EP502	4-870-539-00	PLATE, GROUND				R518	1-259-404-11	CARBON 100 5%	1/6W		
		< MOUNT TERMINAL >				R519	1-259-412-11	CARBON 220 5%	1/6W		
ET501	4-924-264-01	TERMINAL, MOUNT				R520	1-259-452-11	CARBON 10K 5%	1/6W		
		< IC >				R521	1-247-706-11	CARBON 330 5%	1/4W	F	
IC501	8-759-442-42	IC CXD8595Q				R522	1-247-706-11	CARBON 330 5%	1/4W	F	
IC502	8-759-454-42	IC CXD2562Q-CS				R523	1-247-706-11	CARBON 330 5%	1/4W	F	
IC503	8-759-604-35	IC M5F78M05L				R524	1-247-706-11	CARBON 330 5%	1/4W	F	
IC504	8-759-371-51	IC CXA8042AS				R525	1-247-706-11	CARBON 330 5%	1/4W	F	
IC505	8-759-371-51	IC CXA8042AS				R526	1-247-706-11	CARBON 330 5%	1/4W	F	
IC506	8-759-604-95	IC M5F79M07L				R527	1-247-706-11	CARBON 330 5%	1/4W	F	
IC507	8-759-605-00	IC M5F78M07L				R528	1-247-706-11	CARBON 330 5%	1/4W	F	
IC508	8-759-259-12	IC OPA2604AP				R529	1-247-706-11	CARBON 330 5%	1/4W	F	
IC509	8-759-259-12	IC OPA2604AP				R530	1-247-706-11	CARBON 330 5%	1/4W	F	
IC510	8-759-443-33	IC OPA2132PA				R531	1-249-504-11	CARBON 10 5%	1/4W		
IC511	8-759-443-33	IC OPA2132PA				R532	1-249-504-11	CARBON 10 5%	1/4W		
IC512	8-759-053-07	IC OP-27GP				R533	1-249-504-11	CARBON 10 5%	1/4W		
IC513	8-759-053-07	IC OP-27GP				R534	1-249-504-11	CARBON 10 5%	1/4W		
IC514	8-759-242-70	IC TC7WU04F				R535	1-249-504-11	CARBON 10 5%	1/4W		
IC515	8-759-180-84	IC TC7W74F				R536	1-249-504-11	CARBON 10 5%	1/4W		
		< COIL >				R537	1-249-504-11	CARBON 10 5%	1/4W		
L501	1-408-405-00	INDUCTOR 4.7uH				R538	1-249-504-11	CARBON 10 5%	1/4W		
L502	1-408-405-00	INDUCTOR 4.7uH				R539	1-249-514-11	CARBON 27 5%	1/4W		
L503	1-408-405-00	INDUCTOR 4.7uH				R540	1-249-514-11	CARBON 27 5%	1/4W		
L504	1-408-405-00	INDUCTOR 4.7uH				R541	1-249-514-11	CARBON 27 5%	1/4W		
L505	1-408-405-00	INDUCTOR 4.7uH				R542	1-249-514-11	CARBON 27 5%	1/4W		
L506	1-408-405-00	INDUCTOR 4.7uH				R543	1-249-542-11	CARBON 390 5%	1/4W		
L507	1-408-405-00	INDUCTOR 4.7uH				R544	1-249-542-11	CARBON 390 5%	1/4W		
L508	1-408-405-00	INDUCTOR 4.7uH				R545	1-249-542-11	CARBON 390 5%	1/4W		
L509	1-408-405-00	INDUCTOR 4.7uH				R546	1-249-542-11	CARBON 390 5%	1/4W		
		< TRANSISTOR >				R547	1-249-947-11	CARBON 10K 1%	1/4W		
Q501	8-729-224-61	TRANSISTOR 2SK246-Y				R548	1-249-947-11	CARBON 10K 1%	1/4W		
Q502	8-729-224-61	TRANSISTOR 2SK246-Y				R549	1-249-947-11	CARBON 10K 1%	1/4W		
Q505	8-729-140-98	TRANSISTOR 2SD773-34				R550	1-249-947-11	CARBON 10K 1%	1/4W		
		< RESISTOR >				R551	1-249-947-11	CARBON 10K 1%	1/4W		
R501	1-259-380-11	CARBON 10 5%	1/6W			R552	1-249-947-11	CARBON 10K 1%	1/4W		
R502	1-259-380-11	CARBON 10 5%	1/6W			R553	1-249-947-11	CARBON 10K 1%	1/4W		
R503	1-259-404-11	CARBON 100 5%	1/6W			R554	1-249-947-11	CARBON 10K 1%	1/4W		
R504	1-259-380-11	CARBON 10 5%	1/6W			R555	1-249-927-11	CARBON 1.5K 1%	1/4W		
						R556	1-249-927-11	CARBON 1.5K 1%	1/4W		
						R559	1-249-927-11	CARBON 1.5K 1%	1/4W		
						R560	1-249-927-11	CARBON 1.5K 1%	1/4W		
						R565	1-249-977-11	CARBON 180K 1%	1/4W		
						R566	1-249-977-11	CARBON 180K 1%	1/4W		
						R569	1-249-934-11	CARBON 3K 1%	1/4W		
						R570	1-249-934-11	CARBON 3K 1%	1/4W		
						R571	1-249-616-11	CARBON 470K 5%	1/4W		

Ref. No.	Part No.	Description				Remark	Ref. No.	Part No.	Description				Remark
R572	1-249-616-11	CARBON	470K	5%	1/4W		C231	1-126-193-11	ELECT	1uF	20%	50V	
R573	1-259-500-11	CARBON	1M	5%	1/6W								
R574	1-259-500-11	CARBON	1M	5%	1/6W		C232	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
R575	1-249-616-11	CARBON	470K	5%	1/4W		C233	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
							C234	1-126-206-11	ELECT CHIP	100uF	20%	6.3V	
R576	1-249-616-11	CARBON	470K	5%	1/4W		C236	1-126-204-11	ELECT CHIP	47uF	20%	16V	
R577	1-249-528-91	CARBON	100	5%	1/4W		C238	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
R578	1-249-528-91	CARBON	100	5%	1/4W								
R581	1-259-452-11	CARBON	10K	5%	1/6W		C239	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
R582	1-259-452-11	CARBON	10K	5%	1/6W		C240	1-126-204-11	ELECT CHIP	47uF	20%	16V	
							C241	1-126-204-11	ELECT CHIP	47uF	20%	16V	
							C242	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
R583	1-259-452-11	CARBON	10K	5%	1/6W		C243	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
R584	1-249-469-11	CARBON	100K	5%	1/4W								
R585	1-249-469-11	CARBON	100K	5%	1/4W								
R586	1-259-428-11	CARBON	1K	5%	1/6W		C244	1-126-204-11	ELECT CHIP	47uF	20%	16V	
R587	1-259-428-11	CARBON	1K	5%	1/6W		C245	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
		< RELAY >					C246	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
RY501	1-515-802-11	RELAY					C247	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
		< VIBRATOR >					C248	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
X501	1-579-161-11	VIBRATOR, CRYSTAL (45MHz)					C249	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V	
*****							C250	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
*	A-4699-589-A	DIG BOARD, COMPLETE (US)	*****				C251	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
*	A-4699-593-A	DIG BOARD, COMPLETE (AEP,UK,G)	*****				C252	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
		< CAPACITOR >					C255	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C201	1-163-038-91	CERAMIC CHIP	0.1uF		25V		C256	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C202	1-163-038-91	CERAMIC CHIP	0.1uF		25V		C258	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C203	1-163-038-91	CERAMIC CHIP	0.1uF		25V		C259	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C204	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V		C261	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C205	1-163-117-00	CERAMIC CHIP	100PF	5%	50V		C262	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C206	1-126-204-11	ELECT CHIP	47uF	20%	16V		C263	1-163-109-00	CERAMIC CHIP	47PF	5%	50V	
C207	1-163-117-00	CERAMIC CHIP	100PF	5%	50V		C264	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V	
C208	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V		C265	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C209	1-163-038-91	CERAMIC CHIP	0.1uF		25V		C266	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C210	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V		C267	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C211	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V		C268	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C212	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V		C269	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C213	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V		C270	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V	
C214	1-126-204-11	ELECT CHIP	47uF	20%	16V		C271	1-163-117-00	CERAMIC CHIP	100PF	5%	50V	
C215	1-163-038-91	CERAMIC CHIP	0.1uF		25V		C272	1-163-109-00	CERAMIC CHIP	47PF	5%	50V	
C216	1-164-232-11	CERAMIC CHIP	0.01uF		50V		C273	1-163-117-00	CERAMIC CHIP	100PF	5%	50V	
C217	1-163-038-91	CERAMIC CHIP	0.1uF		25V		C275	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C218	1-163-038-91	CERAMIC CHIP	0.1uF		25V								
C219	1-126-204-11	ELECT CHIP	47uF	20%	16V								
C220	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V								
C221	1-163-038-91	CERAMIC CHIP	0.1uF		25V								
C222	1-163-038-91	CERAMIC CHIP	0.1uF		25V								
C223	1-163-231-11	CERAMIC CHIP	15PF	5%	50V								
C224	1-163-231-11	CERAMIC CHIP	15PF	5%	50V								
C225	1-163-117-00	CERAMIC CHIP	100PF	5%	50V								
C226	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V								
C227	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V								
C228	1-163-109-00	CERAMIC CHIP	47PF	5%	50V								
C230	1-163-038-91	CERAMIC CHIP	0.1uF		25V								

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
IC207	8-759-461-47	IC MSM9404AGS-BK				R235	1-216-073-00	METAL CHIP 10K	5%	1/10W	
IC208	8-759-344-86	IC MSM514400C-70SJ				R236	1-216-065-00	METAL CHIP 4.7K	5%	1/10W	
IC210	8-759-272-05	IC TC74VHCT244F(EL)				R237	1-216-109-00	METAL CHIP 330K	5%	1/10W	
IC211	8-759-031-84	IC SC7S04F				R238	1-216-065-00	METAL CHIP 4.7K	5%	1/10W	
IC212	8-759-040-83	IC BA6287F				R239	1-216-082-00	METAL GLAZE 24K	5%	1/10W	
		< JUMPER RESISTOR >				R240	1-216-073-00	METAL CHIP 10K	5%	1/10W	
JW201	1-216-295-91	CONDUCTOR, CHIP (2012)				R241	1-216-073-00	METAL CHIP 10K	5%	1/10W	
		< COIL >				R242	1-216-029-00	METAL CHIP 150	5%	1/10W	
L201	1-412-336-41	INDUCTOR 4.7uH				R243	1-216-097-91	METAL GLAZE 100K	5%	1/10W	
L202	1-412-336-41	INDUCTOR 4.7uH				R244	1-216-097-91	METAL GLAZE 100K	5%	1/10W	
L203	1-412-336-41	INDUCTOR 4.7uH				R245	1-216-097-91	METAL GLAZE 100K	5%	1/10W	
L204	1-412-336-41	INDUCTOR 4.7uH				R246	1-216-097-91	METAL GLAZE 100K	5%	1/10W	
L205	1-412-336-41	INDUCTOR 4.7uH				R247	1-216-097-91	METAL GLAZE 100K	5%	1/10W	
L206	1-412-336-41	INDUCTOR 4.7uH				R248	1-216-097-91	METAL GLAZE 100K	5%	1/10W	
		< TRANSISTOR >				R249	1-216-097-91	METAL GLAZE 100K	5%	1/10W	
Q201	8-729-907-00	TRANSISTOR DTC114EU				R250	1-216-097-91	METAL GLAZE 100K	5%	1/10W	
Q202	8-729-907-00	TRANSISTOR DTC114EU				R251	1-216-073-00	METAL CHIP 10K	5%	1/10W	
		< RESISTOR >				R252	1-216-097-91	METAL GLAZE 100K	5%	1/10W	
R201	1-216-021-00	METAL CHIP 68	5%	1/10W		R253	1-216-097-91	METAL GLAZE 100K	5%	1/10W	
R203	1-216-097-91	METAL GLAZE 100K	5%	1/10W		R254	1-216-073-00	METAL CHIP 10K	5%	1/10W	
R204	1-216-073-00	METAL CHIP 10K	5%	1/10W		R255	1-216-097-91	METAL GLAZE 100K	5%	1/10W	
R205	1-216-097-91	METAL GLAZE 100K	5%	1/10W		R256	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R206	1-216-073-00	METAL CHIP 10K	5%	1/10W		R257	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R207	1-216-049-91	METAL GLAZE 1K	5%	1/10W		R258	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R209	1-216-073-00	METAL CHIP 10K	5%	1/10W		R259	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R210	1-216-073-00	METAL CHIP 10K	5%	1/10W		R260	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R211	1-216-073-00	METAL CHIP 10K	5%	1/10W		R261	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R212	1-216-097-91	METAL GLAZE 100K	5%	1/10W		R262	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R213	1-216-073-00	METAL CHIP 10K	5%	1/10W		R263	1-216-033-00	METAL CHIP 220	5%	1/10W	
R214	1-216-073-00	METAL CHIP 10K	5%	1/10W		R264	1-216-033-00	METAL CHIP 220	5%	1/10W	
R216	1-216-073-00	METAL CHIP 10K	5%	1/10W	(AEP,UK,G)	R265	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R217	1-216-073-00	METAL CHIP 10K	5%	1/10W	(US)	R266	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R218	1-216-073-00	METAL CHIP 10K	5%	1/10W	(US)	R267	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R219	1-216-073-00	METAL CHIP 10K	5%	1/10W	(AEP,UK,G)	R268	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R220	1-216-073-00	METAL CHIP 10K	5%	1/10W		R269	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R221	1-216-073-00	METAL CHIP 10K	5%	1/10W		R270	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R222	1-216-097-91	METAL GLAZE 100K	5%	1/10W		R271	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R223	1-216-097-91	METAL GLAZE 100K	5%	1/10W		R272	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R224	1-216-097-91	METAL GLAZE 100K	5%	1/10W		R273	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R225	1-216-097-91	METAL GLAZE 100K	5%	1/10W		R275	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R226	1-216-073-00	METAL CHIP 10K	5%	1/10W		R276	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R227	1-216-097-91	METAL GLAZE 100K	5%	1/10W		R277	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R228	1-216-073-00	METAL CHIP 10K	5%	1/10W		R278	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R229	1-216-097-91	METAL GLAZE 100K	5%	1/10W		R279	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R230	1-216-109-00	METAL CHIP 330K	5%	1/10W		R280	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R231	1-216-097-91	METAL GLAZE 100K	5%	1/10W		R281	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R232	1-216-073-00	METAL CHIP 10K	5%	1/10W		R282	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R233	1-216-073-00	METAL CHIP 10K	5%	1/10W		R283	1-216-025-91	METAL GLAZE 100	5%	1/10W	
R234	1-216-097-91	METAL GLAZE 100K	5%	1/10W		R284	1-216-025-91	METAL GLAZE 100	5%	1/10W	
						R285	1-216-073-00	METAL CHIP 10K	5%	1/10W	
						R286	1-216-097-91	METAL GLAZE 100K	5%	1/10W	
						R287	1-216-097-91	METAL GLAZE 100K	5%	1/10W	
						R288	1-216-073-00	METAL CHIP 10K	5%	1/10W	
						R289	1-216-097-91	METAL GLAZE 100K	5%	1/10W	
						R290	1-216-025-91	METAL GLAZE 100	5%	1/10W	
						R291	1-216-073-00	METAL CHIP 10K	5%	1/10W	

Ref. No.	Part No.	Description	Remark			
< VIBRATOR >						
X201	1-767-273-11	VIBRATOR, CERAMIC (CHIP TYPE)(10MHz)				
X202	1-760-458-21	VIBRATOR, CRYSTAL (32.768kHz)				

*	A-4699-457-A	DIO BOARD, COMPLETE				

< CAPACITOR >						
C351	1-126-933-11	ELECT	100uF	20%	10V	
C352	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C353	1-164-159-11	CERAMIC	0.1uF		50V	
C354	1-126-933-11	ELECT	100uF	20%	10V	
C355	1-164-159-11	CERAMIC	0.1uF		50V	
C356	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C357	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C358	1-164-159-11	CERAMIC	0.1uF		50V	
C359	1-126-933-11	ELECT	100uF	20%	10V	
C360	1-136-165-00	FILM	0.1uF	5%	50V	
C361	1-126-933-11	ELECT	100uF	20%	10V	
C362	1-126-933-11	ELECT	100uF	20%	10V	
C363	1-126-933-11	ELECT	100uF	20%	10V	
C364	1-136-165-00	FILM	0.1uF	5%	50V	
C365	1-136-165-00	FILM	0.1uF	5%	50V	
C366	1-164-159-11	CERAMIC	0.1uF		50V	
C367	1-164-159-11	CERAMIC	0.1uF		50V	
C368	1-164-159-11	CERAMIC	0.1uF		50V	
C369	1-104-646-11	CERAMIC	2.2uF	20%	50V	
< IC >						
IC351	8-759-926-18	IC SN74HC157ANS				
IC352	8-759-926-17	IC SN74HC153ANS				
IC353	8-759-269-92	IC SN74HCU04ANS-E20				
IC354	8-749-921-12	IC GP1F32T (DIGITAL OUT OPTICAL)				
IC355	8-759-430-27	IC GP1F37R (DIGITAL IN OPT1)				
IC356	8-759-430-27	IC GP1F37R (DIGITAL IN OPT2)				
< JACK >						
J351	1-568-750-21	JACK, PIN (1P SHIELD TYPE) (DIGITAL IN COAXIAL)				
< COIL >						
L351	1-408-405-00	INDUCTOR	4.7uH			
L352	1-408-405-00	INDUCTOR	4.7uH			
L353	1-408-405-00	INDUCTOR	4.7uH			
< RESISTOR >						
R351	1-259-404-11	CARBON	100	5%	1/6W	
R352	1-259-404-11	CARBON	100	5%	1/6W	
R353	1-259-404-11	CARBON	100	5%	1/6W	
R354	1-259-404-11	CARBON	100	5%	1/6W	
R355	1-259-404-11	CARBON	100	5%	1/6W	
R356	1-259-404-11	CARBON	100	5%	1/6W	
R357	1-259-452-11	CARBON	10K	5%	1/6W	
R358	1-259-476-11	CARBON	100K	5%	1/6W	
R359	1-259-404-11	CARBON	100	5%	1/6W	
R360	1-259-452-11	CARBON	10K	5%	1/6W	

Ref. No.	Part No.	Description	Remark		
R361	1-259-404-11	CARBON	100	5%	1/6W
R363	1-259-404-11	CARBON	100	5%	1/6W
R364	1-259-404-11	CARBON	100	5%	1/6W
R365	1-259-401-11	CARBON	75	5%	1/6W
R366	1-259-404-11	CARBON	100	5%	1/6W

*	A-4699-459-A	DISP BOARD, COMPLETE			

*	3-362-478-11	HOLDER (T), LED			
*	4-987-501-01	HOLDER (FL)			
		< CAPACITOR >			
C701	1-164-159-11	CERAMIC	0.1uF		50V
C702	1-162-282-31	CERAMIC	100PF	10%	50V
C703	1-164-159-11	CERAMIC	0.1uF		50V
C704	1-126-154-11	ELECT	47uF	20%	6.3V
C705	1-162-282-31	CERAMIC	100PF	10%	50V
C706	1-162-282-31	CERAMIC	100PF	10%	50V
C707	1-162-282-31	CERAMIC	100PF	10%	50V
C708	1-162-294-31	CERAMIC	0.001uF	10%	50V
C709	1-162-302-11	CERAMIC	0.0022uF	30%	16V
C710	1-162-302-11	CERAMIC	0.0022uF	30%	16V
C712	1-164-159-11	CERAMIC	0.1uF		50V
C713	1-164-159-11	CERAMIC	0.1uF		50V
C714	1-164-159-11	CERAMIC	0.1uF		50V
C715	1-162-286-31	CERAMIC	220PF	10%	50V
C716	1-162-286-31	CERAMIC	220PF	10%	50V
		< CONNECTOR >			
CN701	1-766-201-11	SOCKET, CONNECTOR PIN 11P			
CN702	1-580-473-11	SOCKET, CONNECTOR 26P			
		< DIODE >			
D701	8-719-301-39	DIODE SEL2210S (●)			
D702	8-719-301-49	DIODE SEL2810A (■)			
D703	8-719-303-02	DIODE SEL2510C-D (▶)			
		< FLUORESCENT INDICATOR >			
FL701	1-517-620-11	INDICATOR TUBE, FLUORESCENT			
		< IC >			
IC701	8-759-297-23	IC M66004M8FP			
		< TRANSISTOR >			
Q701	8-729-661-94	TRANSISTOR RT1N141SK-TP			
Q702	8-729-661-94	TRANSISTOR RT1N141SK-TP			
Q703	8-729-661-94	TRANSISTOR RT1N141SK-TP			
		< RESISTOR >			
R701	1-259-464-11	CARBON	33K	5%	1/6W
R702	1-259-404-11	CARBON	100	5%	1/6W
R703	1-259-404-11	CARBON	100	5%	1/6W
R704	1-259-404-11	CARBON	100	5%	1/6W
R705	1-259-404-11	CARBON	100	5%	1/6W
R709	1-259-452-11	CARBON	10K	5%	1/6W
R710	1-259-452-11	CARBON	10K	5%	1/6W

DISP	DVOL	HLIM	HMOT	HP
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Ref. No.	Part No.	Description	Remark		
R723	1-259-464-11	CARBON	33K	5%	1/6W
R724	1-259-452-11	CARBON	10K	5%	1/6W
R725	1-259-444-11	CARBON	4.7K	5%	1/6W
R726	1-259-440-11	CARBON	3.3K	5%	1/6W
R727	1-259-436-11	CARBON	2.2K	5%	1/6W
R728	1-259-452-11	CARBON	10K	5%	1/6W
R729	1-259-464-11	CARBON	33K	5%	1/6W
R730	1-259-452-11	CARBON	10K	5%	1/6W
R731	1-259-444-11	CARBON	4.7K	5%	1/6W
R732	1-259-440-11	CARBON	3.3K	5%	1/6W
R733	1-259-436-11	CARBON	2.2K	5%	1/6W
R734	1-259-412-11	CARBON	220	5%	1/6W
R735	1-259-412-11	CARBON	220	5%	1/6W
R736	1-259-452-11	CARBON	10K	5%	1/6W
R737	1-259-418-11	CARBON	390	5%	1/6W
< SWITCH >					
S702	1-473-965-11	ENCODER, ROTARY	(⏏⏏ AMS ⏏⏏, PUSH ENTER)		
S717	1-554-303-21	SWITCH, TACTILE (⏏ OPEN/CLOSE)			
S718	1-554-303-21	SWITCH, TACTILE (YES)			
S719	1-554-303-21	SWITCH, TACTILE (EDIT/NO)			
S720	1-554-303-21	SWITCH, TACTILE (●)			
S721	1-554-303-21	SWITCH, TACTILE (⏏)			
S722	1-554-303-21	SWITCH, TACTILE (▶)			
S723	1-554-303-21	SWITCH, TACTILE (▶▶)			
S724	1-554-303-21	SWITCH, TACTILE (◀◀)			
S725	1-554-303-21	SWITCH, TACTILE (■)			

*	1-664-822-11	DVOL BOARD	*****		
< CAPACITOR >					
C601	1-162-294-31	CERAMIC	0.001uF	10%	50V
C602	1-104-664-11	ELECT	47uF	20%	25V
C603	1-164-159-11	CERAMIC	0.1uF		50V
< CONNECTOR >					
* CN603	1-564-720-11	PIN, CONNECTOR (SMALL TYPE) 4P			
< VARIABLE RESISTOR >					
RV602	1-225-373-11	RES, VAR, CARBON 10K (DIGITAL REC LEVEL)			

*	1-663-896-11	HLIM BOARD	*****		
< CONNECTOR >					
* CN195	1-750-148-11	SOCKET, CONNECTOR (PC BOARD) 5P			
< SWITCH >					
SW193	1-762-010-11	SWITCH, LEVER (HEAD DOWN DET)			
SW194	1-762-010-11	SWITCH, LEVER (HEAD UP DET)			

Ref. No.	Part No.	Description	Remark			
*	1-663-899-11	HMOT BOARD *****				
< MOTOR >						
M192	X-4947-821-1	MOTOR ASSY, HEAD				
< CONNECTOR >						
* CN196	1-568-947-11	PIN, CONNECTOR 9P				
CN197	1-568-940-21	PIN, CONNECTOR 2P				
* CN198	1-568-941-11	PIN, CONNECTOR 3P				
CN199	1-778-987-11	PIN,BOARD TO BOARD CONNECTOR5P				

*	A-4699-461-A	HP BOARD, COMPLETE *****				
< CAPACITOR >						
C651	1-162-207-31	CERAMIC	22PF	5%	50V	
C652	1-162-207-31	CERAMIC	22PF	5%	50V	
C653	1-126-022-11	ELECT	47uF	20%	25V	
C654	1-126-022-11	ELECT	47uF	20%	25V	
C655	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C656	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C657	1-164-159-11	CERAMIC	0.1uF		50V	
C658	1-164-159-11	CERAMIC	0.1uF		50V	
< CONNECTOR >						
CN651	1-564-723-11	PIN, CONNECTOR (SMALL TYPE) 7P				
< IC >						
IC651	8-759-712-02	IC NJM2114D				
< JACK >						
J651	1-770-904-11	JACK (LARGE TYPE)(PHONES)				
< TRANSISTOR >						
Q651	8-729-231-55	TRANSISTOR	2SC2878-AB			
Q652	8-729-231-55	TRANSISTOR	2SC2878-AB			
Q653	8-729-231-55	TRANSISTOR	2SC2878-AB			
Q654	8-729-231-55	TRANSISTOR	2SC2878-AB			
< RESISTOR >						
R651	1-259-460-11	CARBON	22K	5%	1/6W	
R652	1-259-460-11	CARBON	22K	5%	1/6W	
R653	1-259-444-11	CARBON	4.7K	5%	1/6W	
R654	1-259-458-11	CARBON	18K	5%	1/6W	
R655	1-259-444-11	CARBON	4.7K	5%	1/6W	
R656	1-259-458-11	CARBON	18K	5%	1/6W	
R657	1-259-406-11	CARBON	120	5%	1/6W	
R658	1-259-406-11	CARBON	120	5%	1/6W	
R659	1-259-444-11	CARBON	4.7K	5%	1/6W	
R660	1-259-444-11	CARBON	4.7K	5%	1/6W	
R661	1-259-444-11	CARBON	4.7K	5%	1/6W	
R662	1-259-444-11	CARBON	4.7K	5%	1/6W	

Ref. No.	Part No.	Description	Remark
		< VARIABLE RESISTOR >	
RV651	1-225-372-11	RES, VAR, CARBON 20K/20K (PHONE LEVEL)	

*	1-663-897-11	IN BOARD	

		< CONNECTOR >	
CN191	1-506-481-11	PIN, CONNECTOR 2P	
* CN192	1-568-941-11	PIN, CONNECTOR 3P	
		< SWITCH >	
SW191	1-571-300-21	SWITCH, ROTARY (LOAD IN DET)	

*	1-663-900-11	LMOT BOARD	

M191	X-4947-824-1	MOTOR (LOADING) ASSY	

*	1-663-898-11	OUT BOARD	

		< CONNECTOR >	
CN193	1-506-481-11	PIN, CONNECTOR 2P	
		< SWITCH >	
SW192	1-571-300-21	SWITCH, ROTARY (LOAD OUT DET)	

*	1-664-817-11	PJ BOARD	

		< CAPACITOR >	
C598	1-110-335-11	MYLAR 100PF 5% 50V	
C599	1-110-335-11	MYLAR 100PF 5% 50V	
		< CONNECTOR >	
* CN581	1-564-519-11	PLUG, CONNECTOR 4P	
		< JACK >	
PJ501	1-568-101-11	JACK, PIN 4P (LINE (ANALOG))	
		< RESISTOR >	
R591	1-249-528-91	CARBON 100 5% 1/4W	
R592	1-249-528-91	CARBON 100 5% 1/4W	
R593	1-249-528-91	CARBON 100 5% 1/4W	
R594	1-249-528-91	CARBON 100 5% 1/4W	

Ref. No.	Part No.	Description	Remark
*	A-4699-460-A	PSW BOARD, COMPLETE	

*	4-972-608-01	HOLDER (DIA. 5), LED	
	4-976-360-02	REINFORCEMENT (CONT)	
		< CAPACITOR >	
C711	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C781	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C782	1-164-159-11	CERAMIC 0.1uF 50V	
C783	1-164-159-11	CERAMIC 0.1uF 50V	
C784	1-126-154-11	ELECT 47uF 20% 6.3V	
C785	1-126-154-11	ELECT 47uF 20% 6.3V	
		< CONNECTOR >	
CN781	1-766-204-11	PLUG, CONNECTOR PIN 11P	
		< DIODE >	
D704	8-719-303-02	DIODE SEL2510C-D (FILTER)	
D781	8-719-313-40	DIODE SEL1516W (POWER)	
		< IC >	
IC781	8-759-332-18	IC GP1U27XB	
		< TRANSISTOR >	
Q704	8-729-661-94	TRANSISTOR RT1N141SK-TP	
Q781	8-729-422-57	TRANSISTOR UN4111	
		< RESISTOR >	
R706	1-259-452-11	CARBON 10K 5% 1/6W	
R707	1-259-452-11	CARBON 10K 5% 1/6W	
R708	1-259-452-11	CARBON 10K 5% 1/6W	
R716	1-259-452-11	CARBON 10K 5% 1/6W	
R717	1-259-464-11	CARBON 33K 5% 1/6W	
R718	1-259-452-11	CARBON 10K 5% 1/6W	
R719	1-259-444-11	CARBON 4.7K 5% 1/6W	
R720	1-259-440-11	CARBON 3.3K 5% 1/6W	
R721	1-259-436-11	CARBON 2.2K 5% 1/6W	
R722	1-259-452-11	CARBON 10K 5% 1/6W	
R738	1-259-416-11	CARBON 330 5% 1/6W	
R781	1-259-424-11	CARBON 680 5% 1/6W	
R782	1-259-452-11	CARBON 10K 5% 1/6W	
R783	1-259-452-11	CARBON 10K 5% 1/6W	
R784	1-259-412-11	CARBON 220 5% 1/6W	
R785	1-259-404-11	CARBON 100 5% 1/6W	
		< SWITCH >	
S701	1-762-878-11	SWITCH, ROTARY (INPUT)	
S709	1-554-303-21	SWITCH, TACTILE (PLAY MODE)	
S710	1-554-303-21	SWITCH, TACTILE (FILTER)	
S711	1-554-303-21	SWITCH, TACTILE (SCROLL/CLOCK SET)	
S712	1-554-303-21	SWITCH, TACTILE (REPEAT)	
S713	1-554-303-21	SWITCH, TACTILE (TIME)	
S714	1-554-303-21	SWITCH, TACTILE (DISPLAY/CHAR)	
S781	1-572-625-11	SWITCH, SLIDE (TIMER)	
S782	1-554-303-21	SWITCH, TACTILE (POWER)	

Ref. No.	Part No.	Description	Remark
*	A-4699-455-A	PW BOARD, COMPLETE (US) *****	
*	A-4699-591-A	PW BOARD, COMPLETE (AEP,UK,G) *****	
*	3-309-144-21	HEAT SINK	
*	4-363-146-00	HEAT SINK, V.OUT	
*	4-921-402-01	HEAT SINK	
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
		< BATTERY >	
BT901	1-528-739-11	BATTERY, LITHIUM (VL2020 3V)	
		< CAPACITOR >	
C901	1-164-159-11	CERAMIC 0.1uF	50V
C902	1-126-963-11	ELECT 4.7uF	20% 50V
C903	1-164-159-11	CERAMIC 0.1uF	50V
C904	1-126-963-11	ELECT 4.7uF	20% 50V
C905	1-126-927-11	ELECT 2200uF	20% 10V
C906	1-164-159-11	CERAMIC 0.1uF	50V
C907	1-126-933-11	ELECT 100uF	20% 16V
C909	1-126-927-11	ELECT 2200uF	20% 10V
C911	1-126-960-11	ELECT 1uF	20% 50V
C912	1-164-159-11	CERAMIC 0.1uF	50V
C913	1-164-159-11	CERAMIC 0.1uF	50V
C914	1-126-936-11	ELECT 3300uF	20% 16V
C915	1-164-732-11	CERAMIC 0.1uF	20% 50V
C916	1-164-732-11	CERAMIC 0.1uF	20% 50V
C917	1-124-557-11	ELECT 1000uF	20% 25V
C918	1-117-149-21	ELECT 2200uF	20% 25V
C919	1-126-926-11	ELECT 1000uF	20% 10V
C920	1-164-732-11	CERAMIC 0.1uF	20% 50V
C922	1-164-732-11	CERAMIC 0.1uF	20% 50V
C923	1-164-159-11	CERAMIC 0.1uF	50V
C924	1-126-926-11	ELECT 1000uF	20% 10V
C926	1-164-159-11	CERAMIC 0.1uF	50V
C927	1-126-969-11	ELECT 220uF	20% 50V
C928	1-164-159-11	CERAMIC 0.1uF	50V
C929	1-117-401-11	ELECT 22000uF	20% 16V
C930	1-161-494-00	CERAMIC 0.022uF	25V
C932	1-110-504-11	ELECT 6800uF	20% 35V
C933	1-110-504-11	ELECT 6800uF	20% 35V
C934	1-164-159-11	CERAMIC 0.1uF	50V
C935	1-126-965-11	ELECT 22uF	20% 50V
C936	1-128-554-11	ELECT 330uF	20% 63V
C937	1-126-935-11	ELECT 470uF	20% 16V
C938	1-126-964-11	ELECT 10uF	20% 50V
C939	1-136-153-00	FILM 0.01uF	5% 50V
C940	1-136-153-00	FILM 0.01uF	5% 50V
C941	1-164-159-11	CERAMIC 0.1uF	50V
C942	1-164-159-11	CERAMIC 0.1uF	50V
C943	1-164-159-11	CERAMIC 0.1uF	50V
C944	1-164-159-11	CERAMIC 0.1uF	50V
		< CONNECTOR >	
CN901	1-580-460-11	SOCKET, CONNECTOR 26P	
CN903	1-564-511-11	PLUG, CONNECTOR 8P	
* CN904	1-564-507-11	PLUG, CONNECTOR 4P	

Ref. No.	Part No.	Description	Remark
* CN905	1-564-704-11	PIN, CONNECTOR (SMALL TYPE) 2P	
		< DIODE >	
D901	8-719-987-63	DIODE 1N4148M	
D902	8-719-987-63	DIODE 1N4148M	
D903	8-719-987-63	DIODE 1N4148M	
D904	8-719-987-63	DIODE 1N4148M	
D905	8-719-200-82	DIODE 11ES2	
D907	8-719-210-21	DIODE 11EQS04	
D908	8-719-210-21	DIODE 11EQS04	
D909	8-719-210-29	DIODE F10P10Q	
D910	8-719-210-29	DIODE F10P10Q	
D911	8-719-210-29	DIODE F10P10Q	
D912	8-719-210-29	DIODE F10P10Q	
D913	8-719-014-96	DIODE UZP-7.5BC	
D914	8-719-987-63	DIODE 1N4148M	
D915	8-719-210-29	DIODE F10P10Q	
D916	8-719-210-29	DIODE F10P10Q	
D917	8-719-987-63	DIODE 1N4148M	
D918	8-719-200-77	DIODE 10E2N	
D919	8-719-200-77	DIODE 10E2N	
D920	8-719-200-77	DIODE 10E2N	
D921	8-719-200-77	DIODE 10E2N	
D922	8-719-200-77	DIODE 10E2N	
D923	8-719-987-63	DIODE 1N4148M	
D924	8-719-987-63	DIODE 1N4148M	
		< GROUND PLATE >	
* EP901	4-870-539-00	PLATE, GROUND	
* EP902	4-870-539-00	PLATE, GROUND	
		< FUSE >	
△ F901	1-532-771-21	FUSE, MICRO (SECONDARY)(0.315A 125V)(US)	
△ F902	1-532-783-21	FUSE, MICRO (SECONDARY)(5A 125V)(US)	
△ F903	1-532-783-21	FUSE, MICRO (SECONDARY)(5A 125V)(US)	
△ F904	1-576-071-11	FUSE, MICRO (SECONDARY)(6.3A 125V)(US)	
△ F905	1-576-071-11	FUSE, MICRO (SECONDARY)(6.3A 125V)(US)	
△ F906	1-532-777-21	FUSE, MICRO (SECONDARY)(1.25A 125V)(US)	
		< IC >	
IC901	8-759-327-15	IC M62005L	
IC902	8-759-061-65	IC LA5602	
IC903	8-759-604-45	IC M5F79M12	
IC904	8-759-604-39	IC M5F78M12	
IC905	8-759-513-71	IC PQ05RF21	
IC906	8-759-925-74	IC SN74HC04ANS	
IC907	8-759-513-71	IC PQ05RF21	
IC908	8-759-633-42	IC M5293L	
IC909	8-759-520-49	IC PQ30RV21	
		< IC LINK >	
△ ICP901	1-532-834-21	LINK, IC (PRF 315)(0.315A)(AEP,UK,G)	
△ ICP902	1-532-846-11	LINK, IC (PRF 5000)(5A)(AEP,UK,G)	
△ ICP903	1-532-846-11	LINK, IC (PRF 5000)(5A)(AEP,UK,G)	
△ ICP904	1-532-847-21	LINK, IC (PRF 6300)(6.3A)(AEP,UK,G)	
△ ICP905	1-532-847-21	LINK, IC (PRF 6300)(6.3A)(AEP,UK,G)	
△ ICP906	1-532-840-21	LINK, IC (PRF 1250)(1.25A)(AEP,UK,G)	

The components identified by mark △ or dotted line with mark △ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark			
< TRANSISTOR >						
Q901	8-729-038-19	TRANSISTOR	RT1P144S-TP			
Q902	8-729-038-19	TRANSISTOR	RT1P144S-TP			
Q903	8-729-422-57	TRANSISTOR	UN4111			
Q905	8-729-140-98	TRANSISTOR	2SD773-34			
< RESISTOR >						
R901	1-259-452-11	CARBON	10K	5%	1/6W	
R902	1-259-452-11	CARBON	10K	5%	1/6W	
R903	1-259-404-11	CARBON	100	5%	1/6W	
R904	1-215-404-00	METAL	200	1%	1/4W	
R905	1-215-414-00	METAL	510	1%	1/4W	
R906	1-259-428-11	CARBON	1K	5%	1/6W	
R907	1-259-488-11	CARBON	330K	5%	1/6W	
R908	1-259-404-11	CARBON	100	5%	1/6W	
R909	1-259-468-11	CARBON	47K	5%	1/6W	
R910	1-259-444-11	CARBON	4.7K	5%	1/6W	
R911	1-259-460-91	CARBON	22K	5%	1/6W	
R912	1-259-468-11	CARBON	47K	5%	1/6W	
R913	1-259-428-11	CARBON	1K	5%	1/6W	
R914	1-259-404-11	CARBON	100	5%	1/6W	
R915	1-259-404-11	CARBON	100	5%	1/6W	
R916	1-259-432-11	CARBON	1.5K	5%	1/6W	
R917	1-259-416-11	CARBON	330	5%	1/6W	
< RELAY >						
RY901	1-515-925-11	RELAY (45MHz)				

MISCELLANEOUS						

54	1-782-216-11	WIRE (FLAT TYPE)(30 CORE)				
55	1-782-215-11	WIRE (FLAT TYPE)(18 CORE)				
56	1-777-738-11	WIRE (FLAT TYPE)(26 CORE)				
57	1-777-737-11	WIRE (FLAT TYPE)(16 CORE)				
58	1-777-735-11	WIRE (FLAT TYPE)(18 CORE)				
107	1-777-736-11	WIRE (FLAT TYPE)(26 CORE)				
△ 457	8-583-009-12	OPTICAL PICK-UP KMS-210A/J-N				
△ CNP001	1-558-568-21	CORD, POWER (AEP,UK,G)				
△ CNP001	1-559-583-21	CORD, POWER (US)				
FL701	1-517-620-11	INDICATOR TUBE, FLUORESCENT				
HR901	1-500-304-21	HEAD, OVER WRITE				
M101	A-4660-651-A	MOTOR ASSY (SLED)				
M102	A-4660-650-A	CHASSIS ASSY, BU (SPINDLE)				
M191	X-4947-824-1	MOTOR (LOADING) ASSY				
M192	X-4947-821-1	MOTOR ASSY, HEAD				
S102	1-762-148-11	SWITCH, PUSH (2 KEY)(PROTECT/REFLECT)				
△ T001	1-431-178-11	TRANSFORMER, POWER (AEP,UK,G)				
△ T001	1-431-180-11	TRANSFORMER, POWER (US)				
△ T002	1-431-179-11	TRANSFORMER, POWER (AEP,UK,G)				
△ T002	1-431-181-11	TRANSFORMER, POWER (US)				

Ref. No.	Part No.	Description	Remark
ACCESSORIES & PACKING MATERIALS			

	1-475-091-11	REMOTE COMMANDER (RM-D13M)	
	1-590-925-31	CORD, CONNECTION (AUDIO, 100cm)	
	3-859-239-11	MANUAL, INSTRUCTION (ENGLISH,FRENCH)	
	3-859-239-21	MANUAL, INSTRUCTION (SPANISH,GERMAN,ITALIAN)(AEP,UK,G)	
	3-859-239-31	MANUAL, INSTRUCTION (DUTCH,SWEDISH,PORTUGUESE)(AEP,UK,G)	
	4-983-537-01	COVER, BATTERY (for RM-D13M)	

HARDWARE LIST			

#1	7-685-233-14	SCREW +KTP 2.6X6 TYPE2NON-SLIT (GOLD)	
#1	7-685-233-19	SCREW +KTP 2.6X6 TYPE2NON-SLIT (BLACK)	
#2	7-682-247-09	SCREW +K 3X6	
#3	7-682-565-09	SCREW +B 4X16	
#4	7-685-873-09	SCREW +BVTT 3X10 (S)	
#5	7-685-880-09	SCREW +BVTT 4X6 (S)	
#6	7-685-871-01	SCREW +BVTT 3X6 (S)	
#7	7-682-548-09	SCREW +B 3X8	
#8	7-621-770-67	SCREW +B 2.6X6	
#9	7-621-775-10	SCREW +B 2.6X4	
#10	7-627-553-48	SCREW,PRECISION +P 2X4	
#11	7-685-105-19	TPG +P 2X8, TYPE 2, NON-SLIT	
#12	7-627-852-48	PRECISION SCREW +P1.7X3.5TYPE3	
#13	7-627-852-28	+P 1.7X3	
#14	7-685-871-09	SCREW +BVTT 3X6 (S)	
#15	7-685-533-19	SCREW +BTP 2.6X6 TYPE2 N-S	
#16	7-685-645-79	SCREW +BVTP 3X6 TYPE2 N-S	
#17	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
#18	7-685-133-19	SCREW +P 2.6X6 TYPE2	
#19	7-627-553-38	SCREW,PRECISION +P 2X3	
#20	7-621-255-25	SCREW +P 2X4	
#21	7-685-103-19	SCREW +P 2X5 TYPE2 NON-SLIT	

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Replace only with part number specified.

